

APPENDIX G

EVACUATION OF THE SICK AND WOUNDED

1. General Instructions for the EFMB Test Board.

The candidate will be required to complete the eight performance tasks listed below and pass six of the eight tasks. These tasks will be tested under simulated combat conditions in a battlefield scenario. The candidate will load and unload all casualties by category of precedence.

2. Objectives.

To measure the candidate's ability to evacuate casualties using manual carries and tactical Army vehicles and aircraft under simulated combat conditions in a battlefield scenario.

3. General Conditions Statement.

These tasks will be tested in a lane using reaction testing.

4. Tasks.

- a. Transport a Casualty on an Improvised Litter.
- b. Perform a Four-Hand Seat Carry.
- c. Perform a Fireman's Carry.
- d. Perform a Pistol-Belt Carry.
- e. Load and Unload a Front Line Ambulance Truck.
- f. Load and Unload a 2 1/2-ton Cargo Truck.
- g. Load and Unload a 1 1/4-ton Ambulance Truck.
- h. Load and Unload a Helicopter.

NOTE

All casualties will weigh between 130 and 200 pounds. Mannequins will not be used.

Section I

MANUAL CARRIES

MAIN OBJECTIVE: Given a situation and a list of actions, select the correct action to evacuate a casualty from the point of injury to a higher level of medical care.

REFERENCES: FM 8-10-6, Chapters 8, 9, and Appendix A.
FM 21-11, Appendix B.

MANUAL EVACUATION

G-1. General.

Manual evacuation is the process of transporting casualties by manual carries. It is accomplished without the aid of a litter or other forms of transport. It is intended to end at the point where a more sophisticated means of evacuation becomes available. For example, manual evacuation ends when either a litter or a vehicle becomes available.

G-2. Casualty Handling.

Casualties evacuated by manual means must be carefully handled. Rough or improper handling may cause further injury to the casualty. The evacuation effort should be organized and performed methodically. Each movement made in lifting or moving casualties should be performed as deliberately and gently as possible. Casualties should not be moved before the type and extent of their injuries are evaluated and the required EMT is administered.

NOTE

The exception to this occurs when the situation dictates immediate movement for safety reasons. For example, if a casualty is on the ground near a burning vehicle, it may be necessary to move him a safe distance away from the vehicle. This situation dictates that the urgency of casualty movement outweighs the need to administer EMT. When immediate movement of casualties is required, they should be moved only far enough to be out of danger.

G-3. Casualty Treatment.

a. Many lifesaving and life-preserving measures are carried out before evacuating injured or wounded soldiers. Except in extreme emergencies, the type and extent of injuries

must be evaluated before any movement of the casualty is attempted. Measures are taken, as needed, to:

- (1) Open the airway and restore breathing and heartbeat.
- (2) Stop bleeding.
- (3) Prevent or control shock.
- (4) Protect the wound from further contamination.

b. When a fracture is evident or suspected, the injured part must be immobilized. Every precaution must be taken to prevent broken ends of bone from cutting through muscle, blood vessels, nerves, and skin.

c. When a casualty has a serious wound, the dressing over the wound should be reinforced to provide additional protection during manual evacuation.

G-4. General Rules for Bearers.

a. In manual evacuation, individuals performing the evacuation are referred to as bearers. Improper handling of a casualty can result in injury to the bearers as well as to the casualty. To minimize disabling injuries (muscle strain, sprains, or other injuries) that could hamper the evacuation effort, the following rules should be followed:

- (1) Use the body's natural system of levers when lifting and moving a casualty.
- (2) Know your physical capabilities and limitations.
- (3) Maintain solid footing when lifting and transporting a casualty.
- (4) Use the leg muscles (not the back muscles) when lifting or lowering a casualty.
- (5) Use the shoulder and leg muscles (not the back muscles) when carrying or standing with a casualty.
- (6) Keep the back straight; use arms and shoulders when pulling a casualty.
- (7) Work in unison with other bearers, using deliberate, gradual movements.
- (8) Slide or roll, rather than lift, heavy objects that must be moved.

(9) Rest frequently, or whenever possible, while transporting a casualty.

b. Normally, a casualty's individual weapon is not moved through the evacuation chain with him. Weapons are turned in at the first available MTF (BAS or division clearing station) to be returned through supply channels. Individual equipment, to include protective clothing and mask, remains with the casualty and is evacuated with him.

G-5. **Manual Carries.**

Manual carries are tiring for the bearers and involve the risk of increasing the severity of the casualty's injuries. In some instances, however, they are essential to save the casualty's life. When a litter is not available or when the terrain or combat situation makes other forms of casualty transport impractical, a manual carry may be the only means to transport a casualty to where a medic can treat him. The distance a casualty can be transported by a manual carry depends upon many factors, such as:

- a. Strength and endurance of the bearers.
- b. Weight of the casualty.
- c. Nature of the injuries.
- d. Obstacles encountered during transport.

G-6. **Casualty Positioning.**

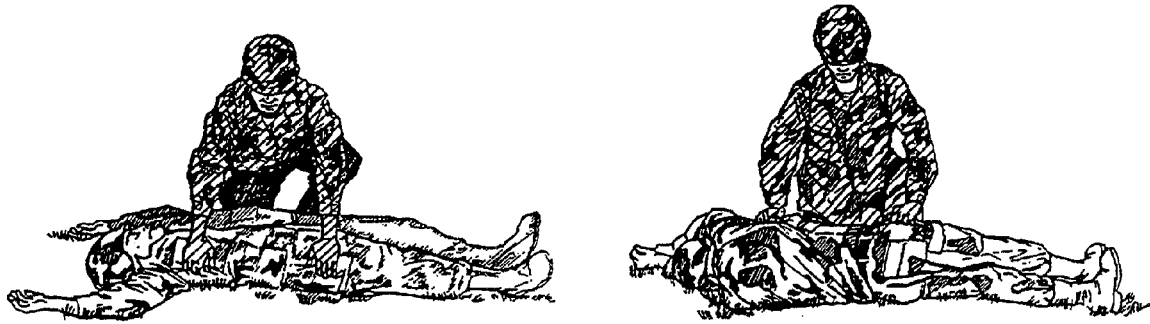
The first step in any manual carry is to position the casualty to be lifted. If he is conscious, he should be told how he is to be positioned and transported. This helps to lessen his fear of movement and to gain his cooperation. It may be necessary to roll the casualty onto his abdomen, or his back, depending upon the position in which he is lying and the particular carry to be used.

a. To roll a casualty onto his abdomen, kneel at the casualty's uninjured side.

(1) Place his arms above his head; cross his ankle which is farther from you over the one that is closer to you.

(2) Place one of your hands on the shoulder which is farther from you; place your other hand in the area of his hip or thigh.

(3) Roll him gently toward you onto his abdomen (Figure G-1).



**Figure G-1. Positioning the Casualty
(On His Abdomen)**

b. To roll a casualty onto his back, follow the same procedure described in a. above, except gently roll the casualty onto his back, rather than onto his abdomen (Figure G-2).



Figure G-2. Positioning the Casualty on His Back

G-7. Categories of Manual Carries.

a. One-Man Carries. These carries should be used when only one bearer is available to transport the casualty.

(1) The fireman's carry (Figure G-3) is one of the easiest ways for one individual to carry another. After an unconscious or disabled casualty has been properly positioned (Figure G-1), he is raised from the ground, then supported and placed in the carrying position.

(a) After rolling the casualty onto his abdomen, straddle him. Extend your hands under his chest and lock them together.

(b) Lift the casualty to his knees as you move backwards.

(c) Continue to move backward, thus straightening the casualty's legs and locking his knees.

(d) Walk forward, bringing the casualty to a standing position; tilt him slightly backward to prevent his knees from buckling.

(e) As you maintain constant support of the casualty with one arm, free your other arm, quickly grasp his wrist, and raise his arm high. Instantly pass your head under his raised arm, releasing it as you pass under it.

(f) Move swiftly to face the casualty and secure your arms around his waist. Immediately place your foot between his feet and spread them apart (approximately 6 to 8 inches).

(g) Grasp the casualty's wrist and raise his arm high over your head.

(h) Bend down and pull the casualty's arm over and down on your shoulder, bringing his body across your shoulders. At the same time, pass your arm between his legs.

(i) Grasp the casualty's wrist with one hand, and place your other hand on your knee for support.

(j) Rise with the casualty positioned correctly. Your other hand is free for use.

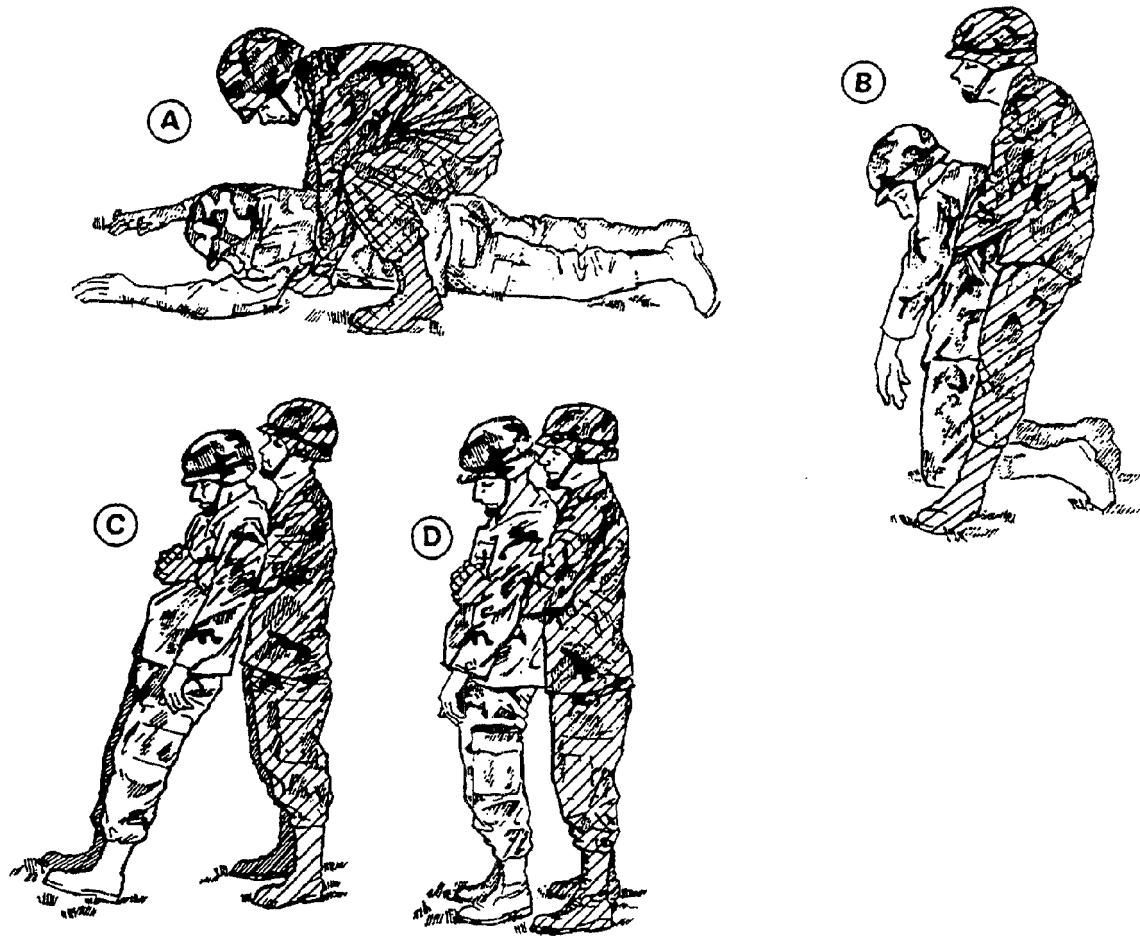


Figure G-3. Fireman's Carry

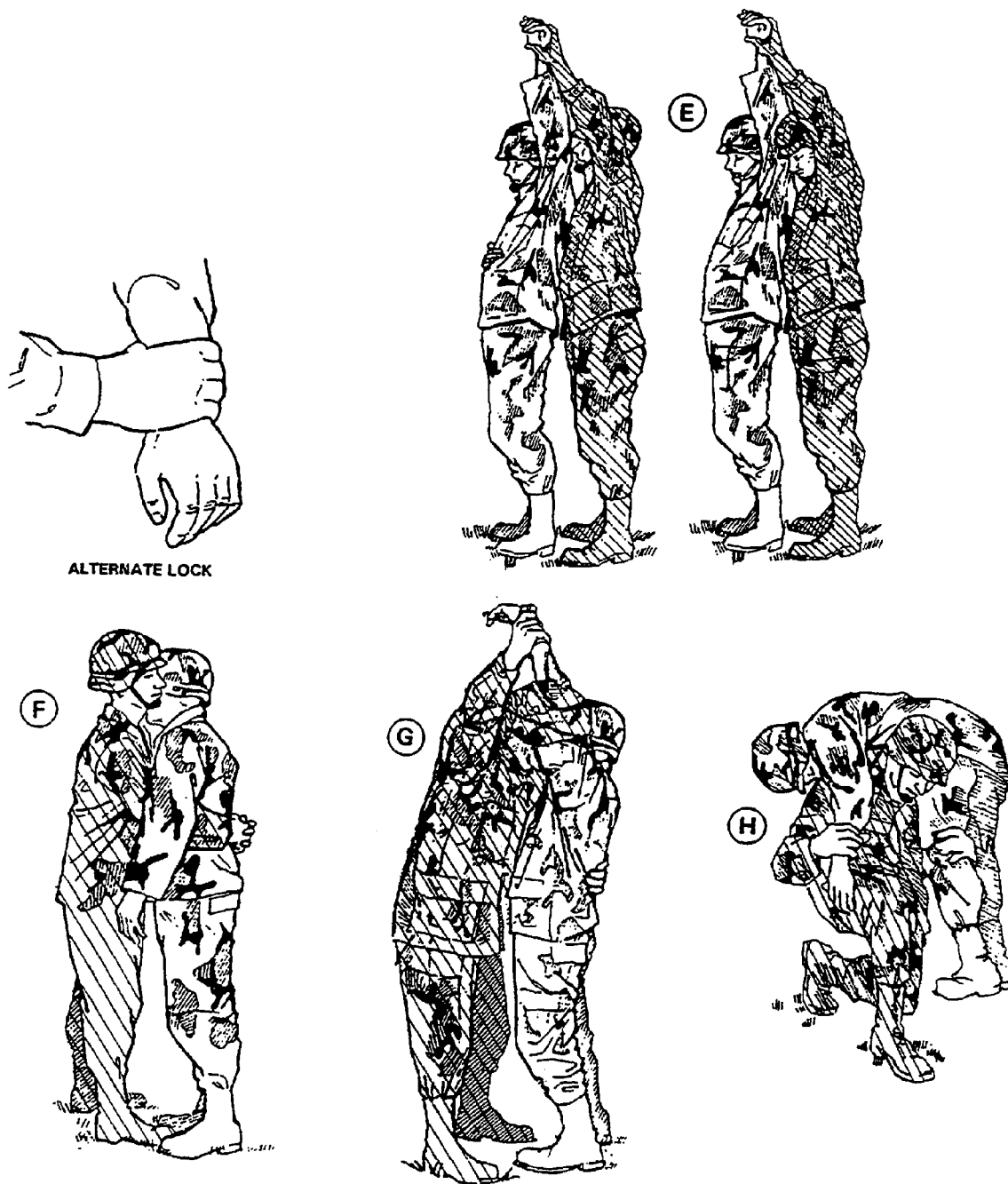


Figure G-3. Fireman's Carry (continued)

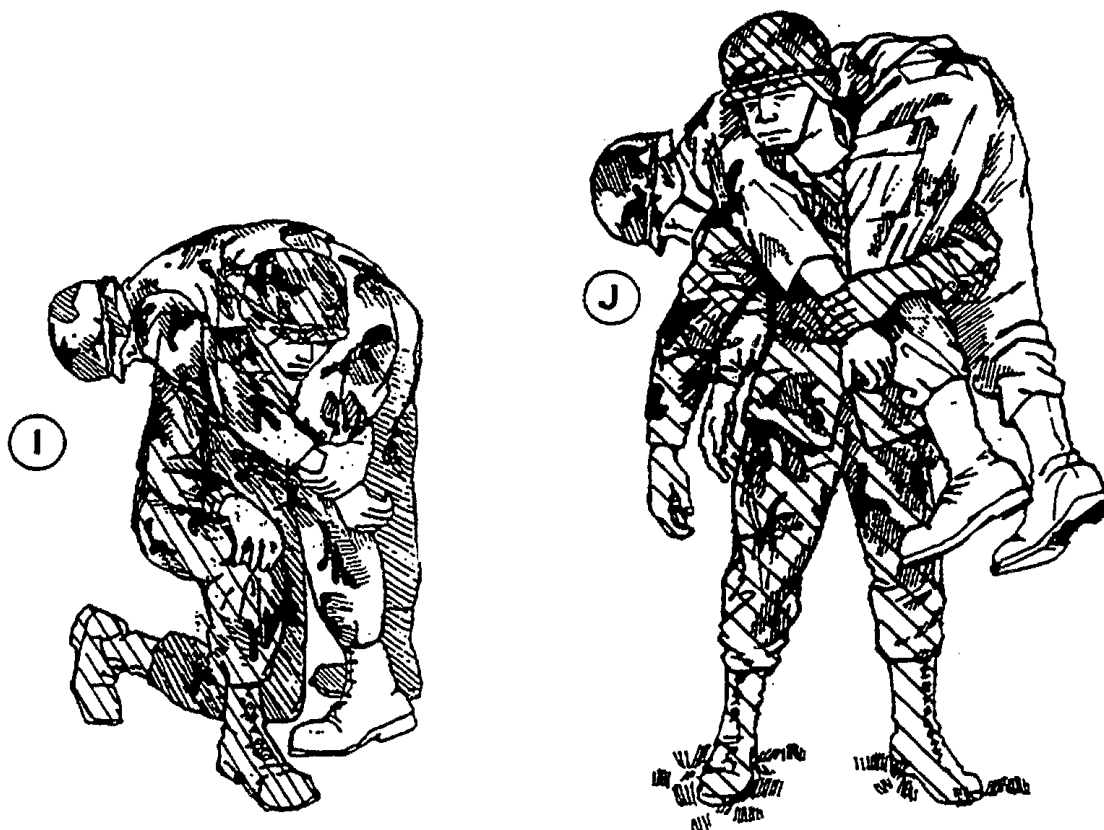


Figure G-3. Fireman's Carry (continued)

b. The alternate method of the fireman's carry for raising a casualty from the ground is illustrated in Figure G-4; however, it should be used only when the bearer believes it to be safer for the casualty because of the location of his wounds. When the alternate method is used, care must be taken to prevent the casualty's head from snapping back and causing a neck injury. The steps for raising a casualty from the ground for the fireman's carry are also in other one-man carries.

(1) Kneel on one knee at the casualty's head and face his feet. Extend your hands under his armpits, down his sides, and across his back.

(2) As you rise, lift the casualty to his knees. Then secure a lower hold and raise him to a standing position with his knees locked.

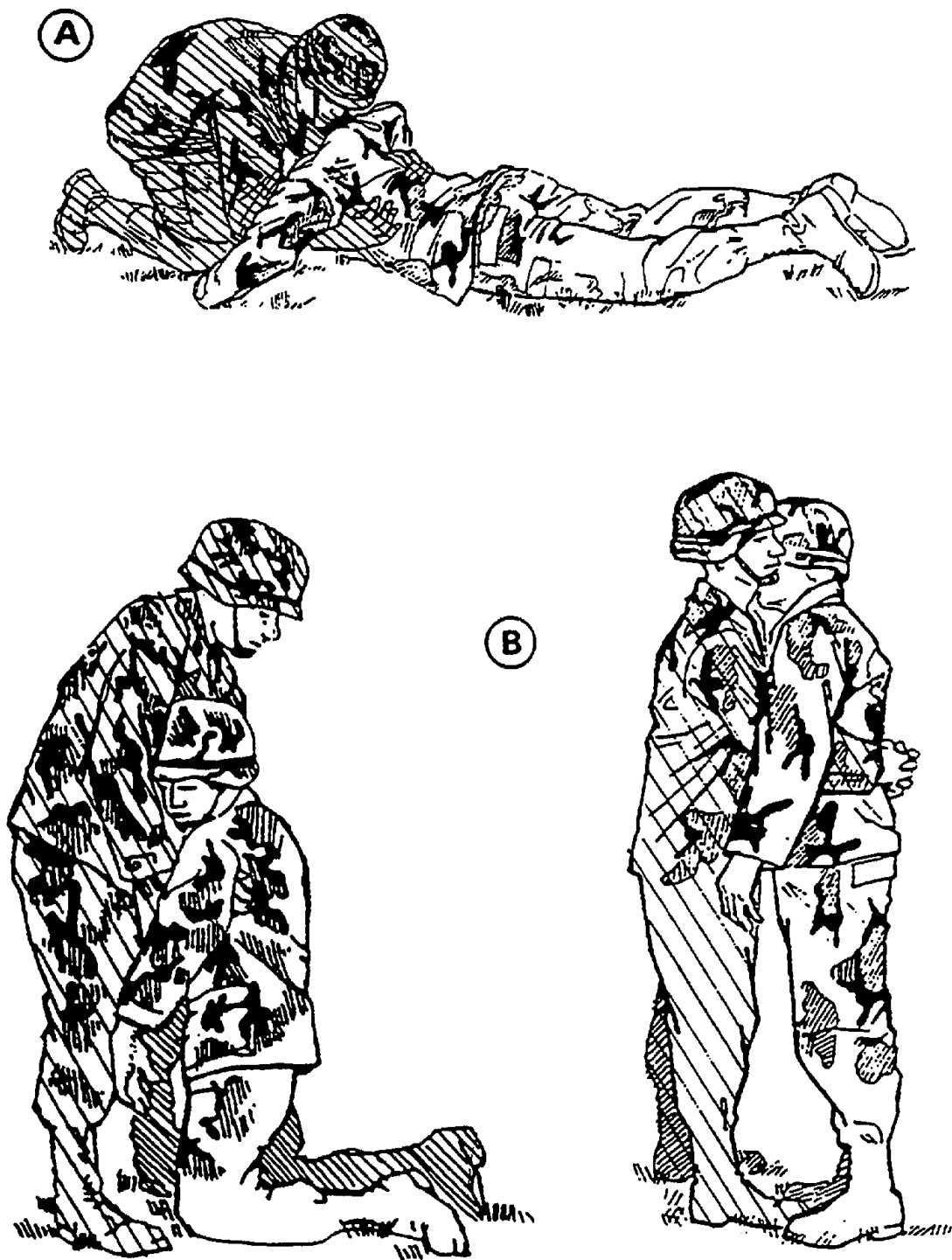


Figure G-4. Fireman's Carry Alternate Method for Lifting the Casualty to a Standing Position

c. In the supporting carry (Figure G-5), the casualty must be able to walk, or at least hop, on one leg, using the bearer as a crutch. This carry can be used to transport a casualty as far as he is able to walk or hop.

(1) Raise the casualty from the ground to a standing position by using the fireman's carry.

(2) Grasp the casualty's wrist and draw his arm around your neck.

(3) Place your arm around his waist. The casualty is now able to walk or hop, using you as a support.



Figure G-5. Supporting Carry



Figure G-6. Arms Carry

d. The arms carry (Figure G-6) is useful in carrying a casualty for a short distance (up to 50 meters) and for placing a casualty on a litter.

(1) Raise or lift the casualty from the ground to a standing position, as in the fireman's carry.

(2) Place one arm under the casualty's knees and your other arm around his back.

(3) Lift the casualty.

(4) Carry the casualty high to lessen fatigue.

e. Only a conscious casualty can be transported by the saddleback carry (Figure G-7) because he must be able to hold onto the bearer's neck. To use this technique:

(1) Raise the casualty to an upright position, as in the fireman's carry.

(2) Support the casualty by placing an arm around his waist. Move to the casualty's side. Have the casualty put his arm around your neck and move in front of him with your back to him.

(3) Have the casualty encircle his arms around your neck.

(4) Stoop, raise him on your back, and clasp your hands together beneath his thighs, if possible.



Figure G-7.
Saddleback Carry

f. In the pack-strap carry (Figure G-8), the casualty's weight rests high on your back. This makes it easier for you to carry the casualty a moderate distance (50 to 300 meters). To eliminate the possibility of injury to the casualty's arms, you must hold the casualty's arms in a palms-down position.

(1) Lift the casualty from the ground to a standing position, as in the fireman's carry.

(2) Support the casualty with your arms around him and grasp his wrist closer to you.

(3) Place his arm over your head and across your shoulders.

(4) Move in front of him while still supporting his weight against your back.

(5) Grasp his other wrist and place this arm over your shoulder.

(6) Bend forward and raise or hoist the casualty as high on your back as possible so that his weight is resting on your back.

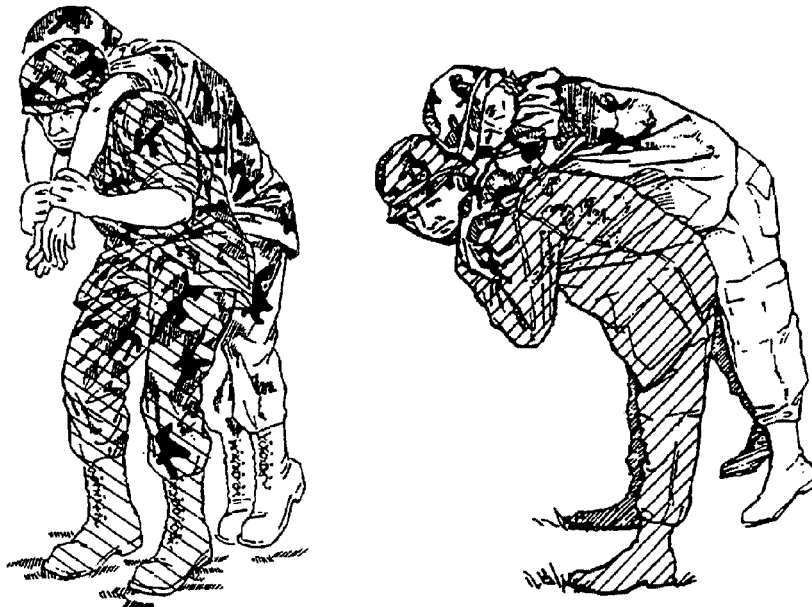


Figure G-8. Pack-Strap Carry

NOTE

Once the casualty is positioned on the bearer's back, the bearer remains as erect as possible to prevent straining or injuring his back.

g. The pistol-belt carry (Figure G-9) is the best one-man carry for a long distance (over 300 meters). The casualty is securely supported upon your shoulders by a belt. Both your hands and the casualty's (if conscious) are free for carrying a weapon, equipment, or climbing obstacles. With your hands free

and the casualty secured in place, you are also able to creep through shrubs and under low-hanging branches.

(1) Link two pistol belts (or three, if necessary) together to form a sling. Place the sling under the casualty's thighs and lower back so that a loop extends from each side.

NOTE

If pistol belts are not available for use, other items such as a rifle sling, two cravat bandages, two litter straps, or any other suitable material which will not cut or bind the casualty may be used.

(2) Lie face up between the casualty's outstretched legs. Thrust your arms through the loops and grasp his hands and trouser leg on his injured side.

(3) Roll toward the casualty's uninjured side onto your abdomen, bringing him onto your back. Adjust the sling, if necessary.

(4) Rise to a kneeling position. The belt will hold the casualty in place.

(5) Place one hand on your knee for support and rise to an upright position. (The casualty is supported on your shoulders.)

(6) Carry the casualty with your hands free for use in rifle firing, climbing, or surmounting obstacles.



Figure G-9. Pistol-Belt Carry

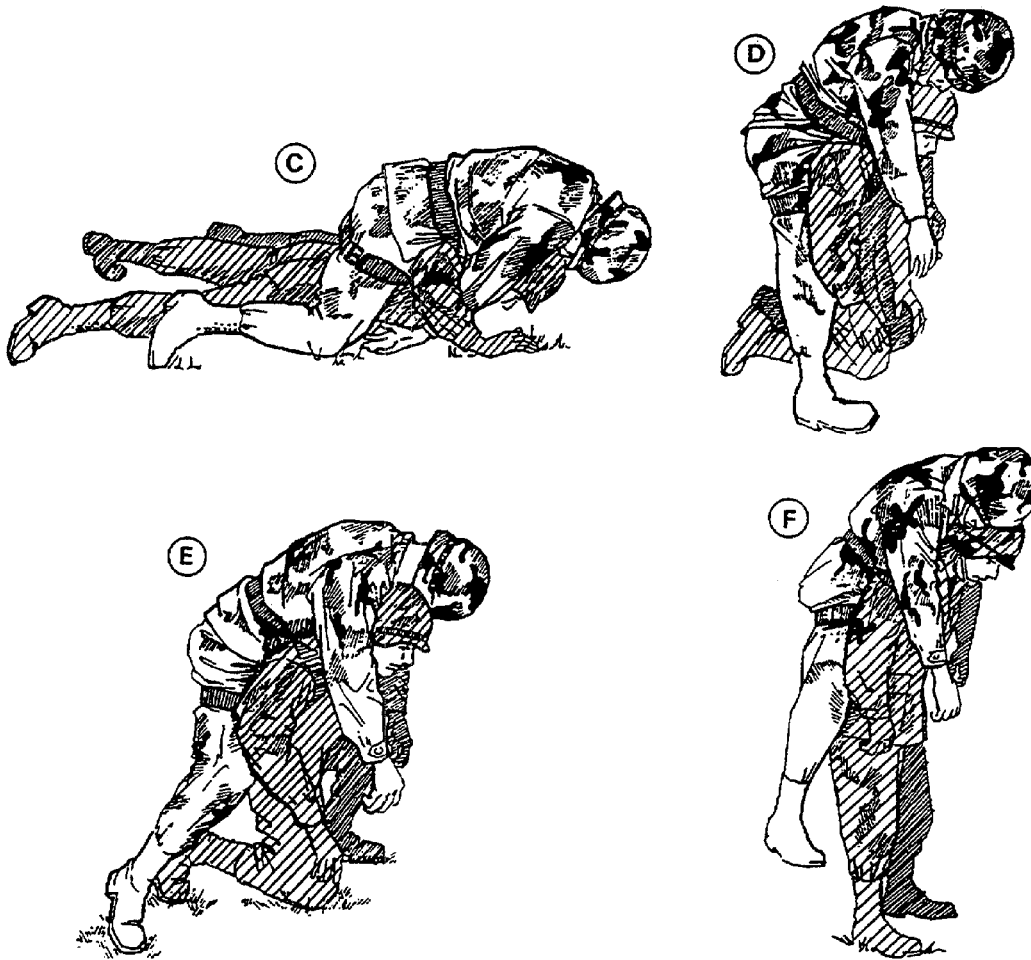


Figure G-9. Pistol-Belt Carry (continued)

h. The pistol-belt drag (Figure G-10), as well as other drags, is generally used for short distances (up to 50 meters). This drag is useful in combat, since both the bearer and the casualty can remain closer to the ground than in other drags.

(1) Extend two pistol belts or similar objects to their full length and join them together to make a continuous loop.

(2) Roll the casualty onto his back, as in the fireman's carry.

(3) Pass the loop over the casualty's head, and position it across his chest and under his armpits. Then cross the remaining portion of the loop, thus forming a figure eight.

(4) Lie on your side facing the casualty.

(5) Slip the loop over your head and turn onto your abdomen. This enables you to drag the casualty as you crawl.



Figure G-10. Pistol-Belt Drag

i. The neck drag (Figure G-11) is useful in combat because the bearer can transport the casualty as he creeps behind a low wall or shrubbery, under a vehicle, or through a culvert. If the casualty is unconscious, his head must be protected from the ground. The neck drag cannot be used if the casualty has a broken arm.

NOTE

If the casualty is conscious, he may clasp his hands together around your neck.

- (1) Tie the casualty's hands together at the wrists.
- (2) Straddle the casualty in a kneeling face-to-face position.
- (3) Loop the casualty's tied hands over and around your neck.
- (4) Crawl forward dragging the casualty with you.

NOTE

If the casualty is unconscious, protect his head from the ground.

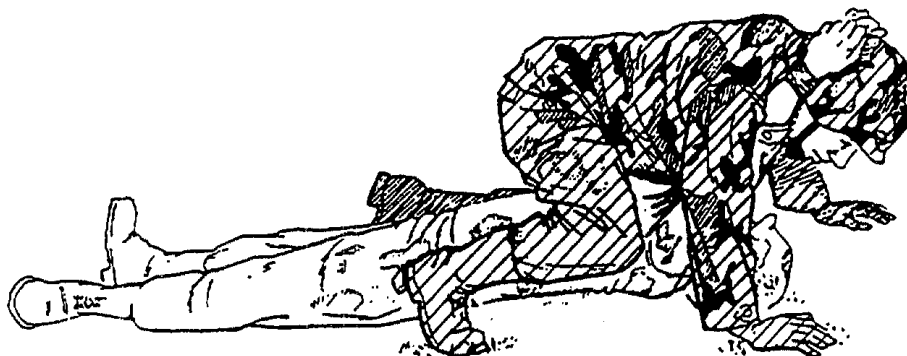


Figure G-11. Neck Drag

j. The cradle-drop drag (Figure G-12) is effective in moving a casualty up or down steps.

(1) Kneel at the casualty's head (with him lying on his back). Slide your hands, with palms up, under the casualty's shoulders and get a firm hold under his armpits.

(2) Rise (partially), supporting the casualty's head on one of your forearms. (You may bring your elbows together and let the casualty's head rest on both of your forearms.)

(3) Rise and drag the casualty backward. (The casualty is in a semisitting position.)

(4) Back down the steps, supporting the casualty's head and body and letting his hips and legs drop from step to step.

NOTE

If the casualty needs to be moved up the steps, you should back up the steps using the same procedure.

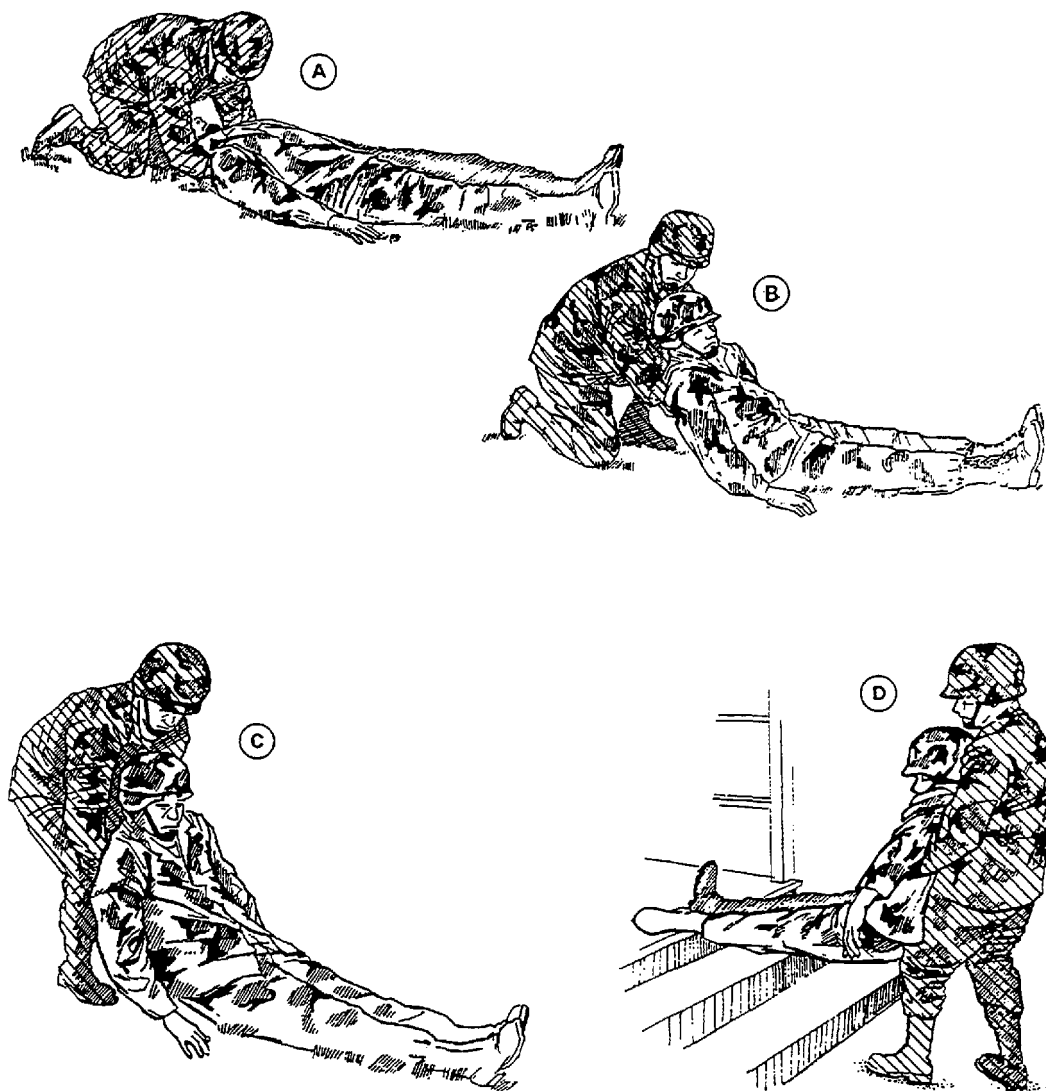


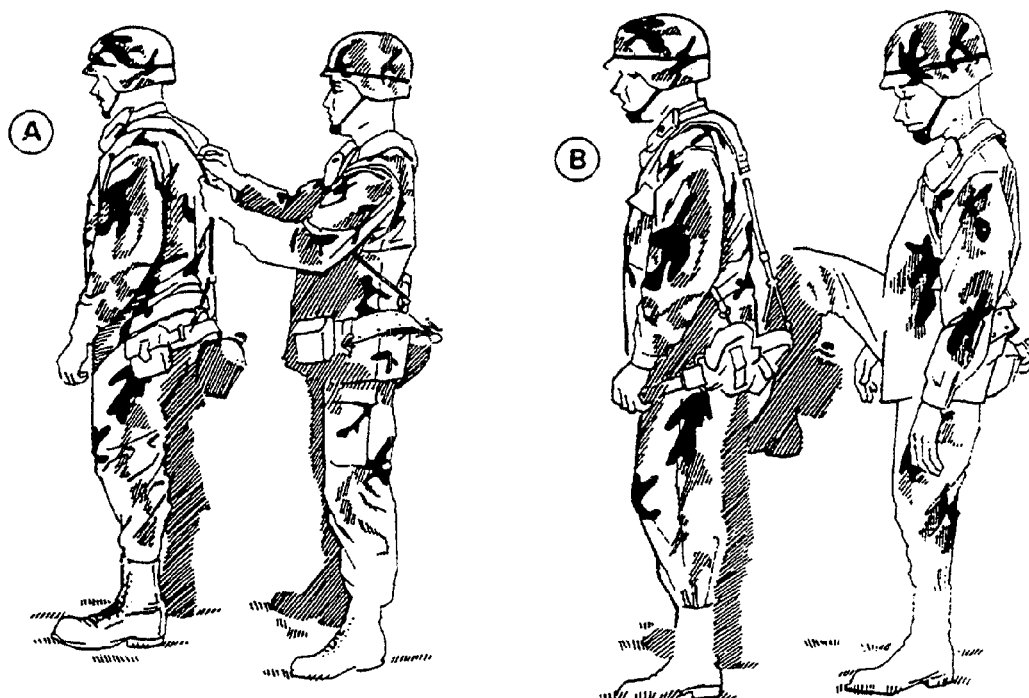
Figure G-12. Cradle-Drop Drag

k. The load bearing equipment (LBE) carry using the bearer's LBE can be used with a conscious casualty (Figure G-13).

- (1) Loosen all suspenders on your LBE.
- (2) Have the casualty place one leg into the loop formed by your suspenders and pistol belt.
- (3) Squat in front of the standing casualty. Have him place his other leg into the loop, also.
- (4) Have the casualty place his arms over your shoulders, lean forward onto you back, and lock his hands together.

(5) Stand up and lean forward into a comfortable position.

(6) Continue mission.



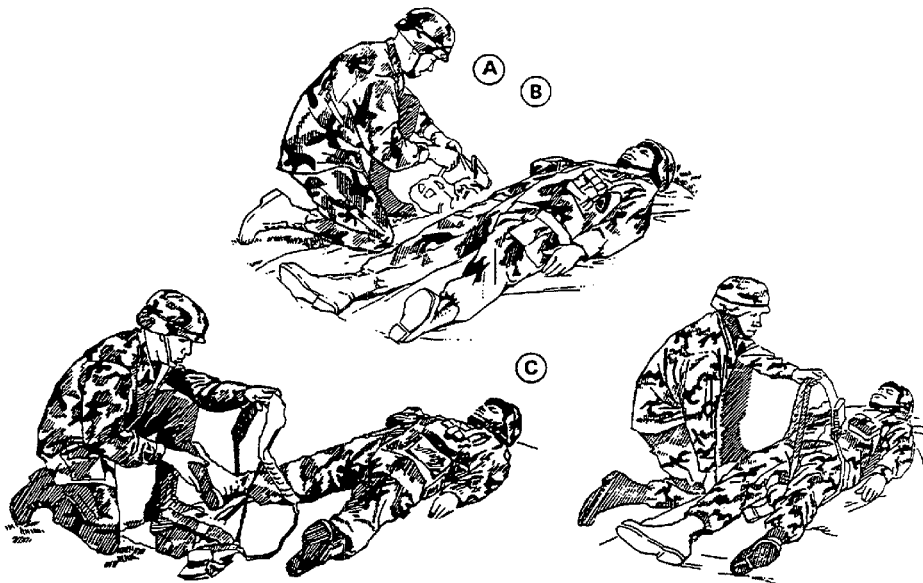
**Figure G-13. LBE Carry Using Bearer's LBE
(Conscious Casualty)**



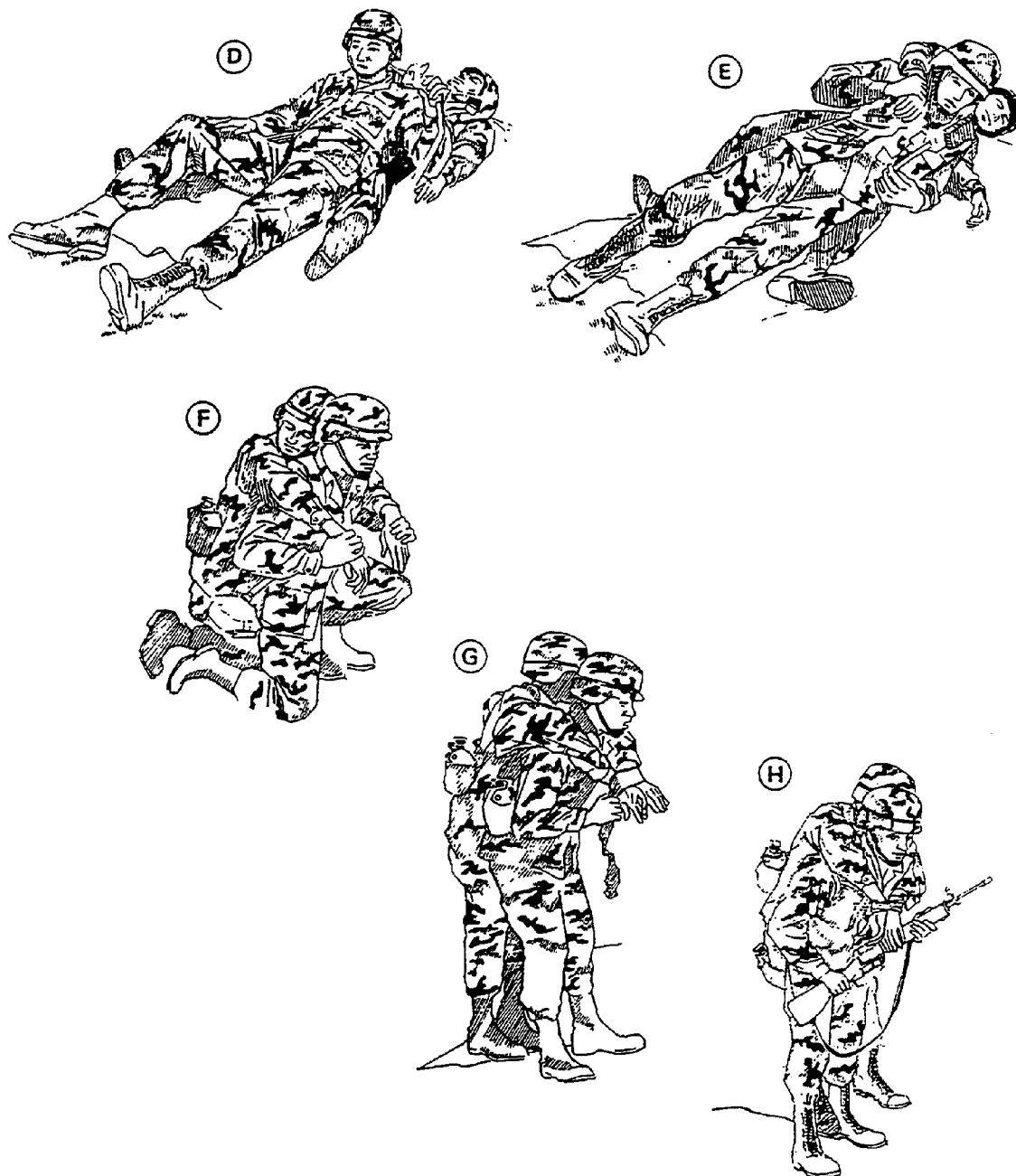
Figure G-13. LBE Carry Using Bearer's LBE
(Conscious Casualty) (continued)

1. The LBE carry using the bearer's LBE can be used with an unconscious casualty or one who cannot stand (Figure G-14).

- (1) Position the casualty on the flat of his back.
- (2) Remove your LBE and loosen all suspender straps.
- (3) Lift the casualty's leg and place it through the loop formed by your suspenders and pistol belt. Then place the other leg. The LBE is moved up until the pistol belt is behind the casualty's thighs.
- (4) Lay between the casualty's legs; work his arms through his LBE suspenders.
- (5) Grasp the casualty's hand (on the injured side), and roll the casualty (on his uninjured side) onto his back.
- (6) Rise to one knee and then push into a standing position.
- (7) Bring the casualty's arms over your shoulders. Grasp his hands and secure them if the casualty is unconscious. If the casualty is conscious, have him lock his hands in front if he is able to do so.
- (8) Lean forward into a comfortable position and continue the mission.



**Figure G-14. LBE Carry Using Bearer's LBE
(Unconscious Casualty or Cannot Stand)**



**Figure G-14 LBE Carry Using Bearer's LBE
(Unconscious Casualty or Cannot Stand) (continued)**

m. The LBE carry using the casualty's LBE (Figure G-15) can be used with a conscious or unconscious casualty.

(1) Position the casualty on his back with his LBE on.

(2) Loosen the casualty's two front suspenders.

(3) Position yourself between the casualty's legs, and slip your arms into the casualty's two front suspenders (up to his shoulders).

(4) Work his arms out of his LBE suspenders.

(5) Grasp the casualty's hand (on the injured side, and roll him (on his uninjured side) onto his back.

(6) Rise to one knee, then into a standing position.

(7) Grasp the casualty's hands and secure them, if the casualty is unconscious. Have the casualty lock his hands in front of you, if he is conscious.

(8) Lean forward into a comfortable position and continue the mission.

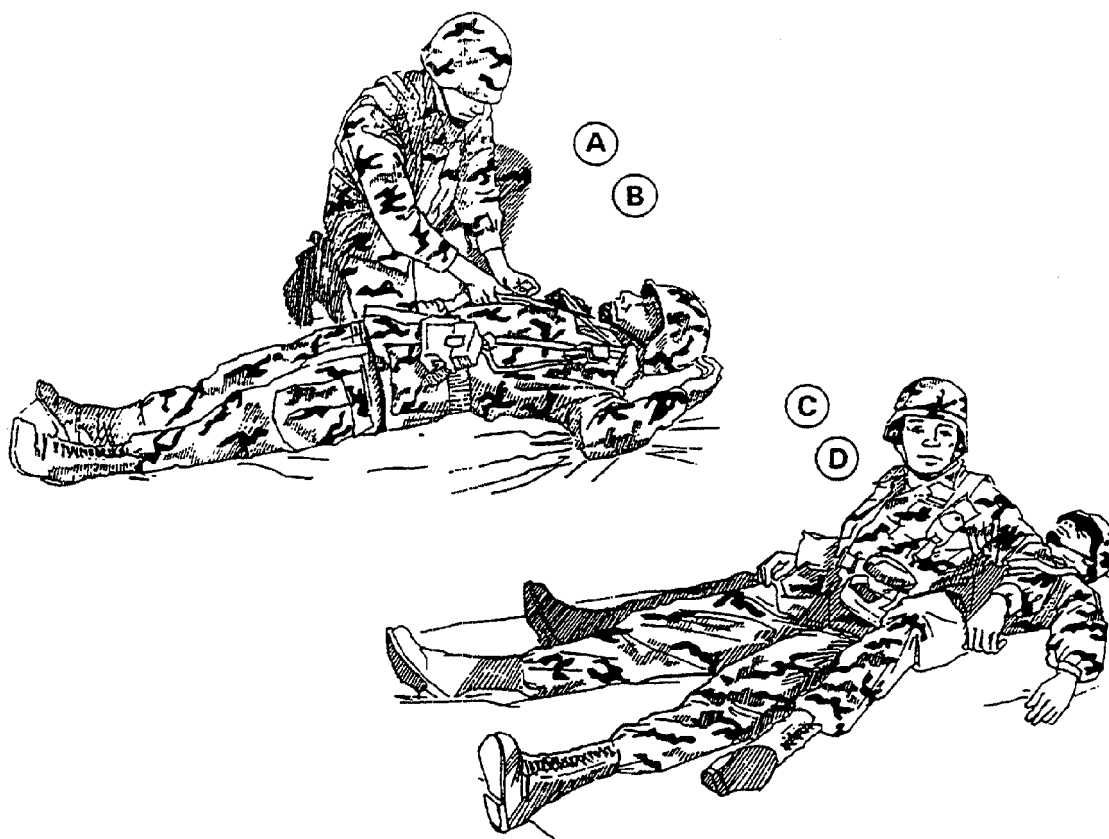


Figure G-15. LBE Carry Using Casualty's LBE

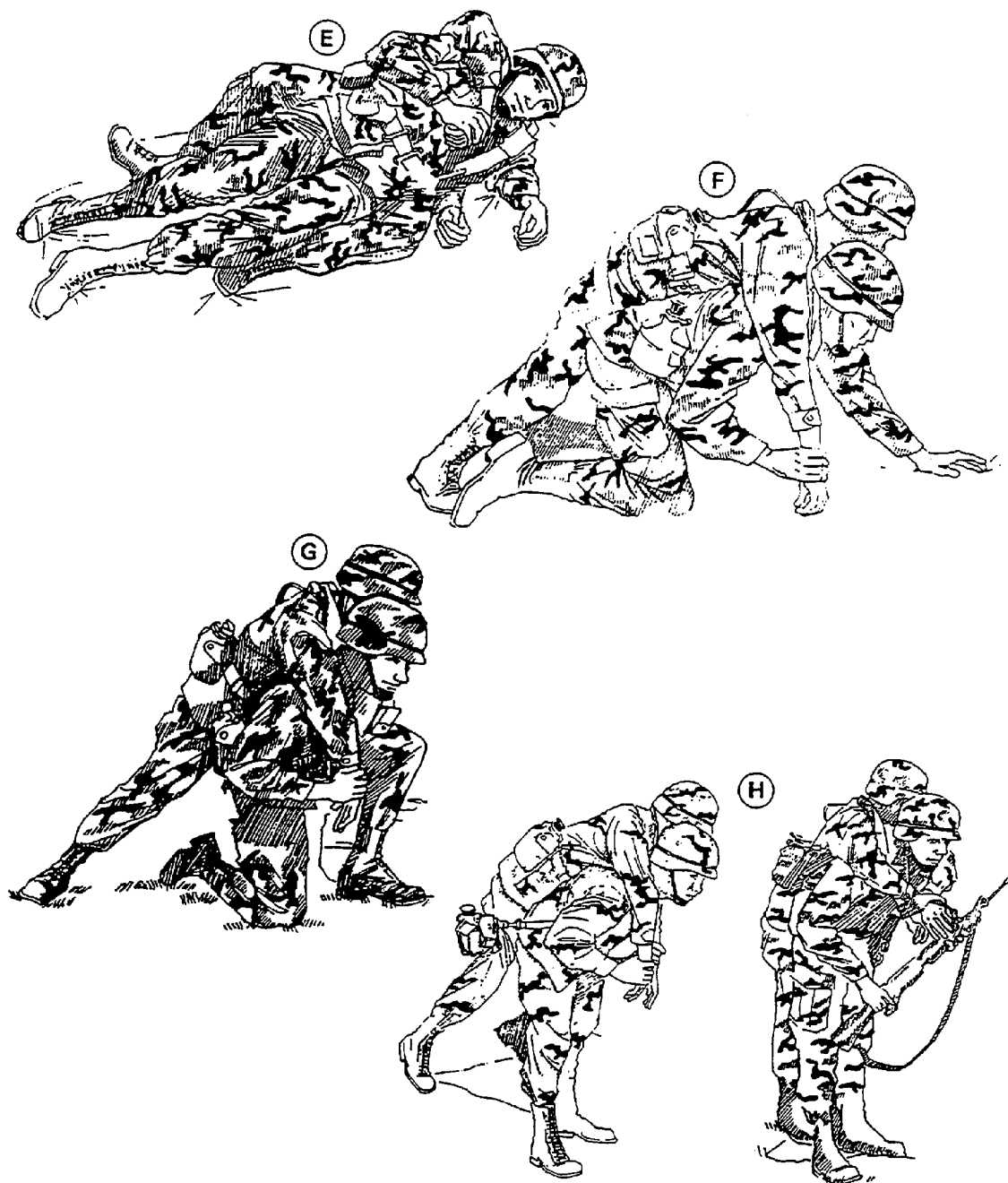


Figure G-15. LBE Carry Using Casualty's LEB (continued)

b. Two-Man Carries. These carries should be used whenever possible. They provide more casualty comfort, are less likely to aggravate injuries, and are less tiring for the bearers. Five different two-man carries can be used.

(1) The two-man supporting carry (Figure G-16) can be used in transporting both conscious and unconscious casualties. If the casualty is taller than the bearers, it may be necessary

for the bearers to lift the casualty's legs and let them rest on their forearms. The bearers:

(a) Help the casualty to his feet and support him with their arms around his waist.

(b) Grasp the casualty's wrists and draw his arms around their necks.

(2) The two-man arm carry (Figure G-17) is useful in carrying a casualty for a moderate distance (50 to 300 meters)



Figure G-16. Two-Man Supporting Carry

and placing him on a litter. To lessen fatigue, the bearers should carry the casualty high and as close to their chests as possible. In extreme emergencies when there is not time to obtain a spine board, this carry is the safest one for transporting a casualty with a back injury. If possible, two additional bearers should be used to keep the casualty's head and legs in alignment with his body. The bearers:

(a) Kneel at one side of the casualty and extend his arms above his head; then they place their arms beneath the casualty's back, waist, hips, and knees.

(b) Lift the casualty while rising to their knees.

(c) Turn the casualty toward their chests, while rising to a standing position. Carry the casualty high to lessen fatigue.

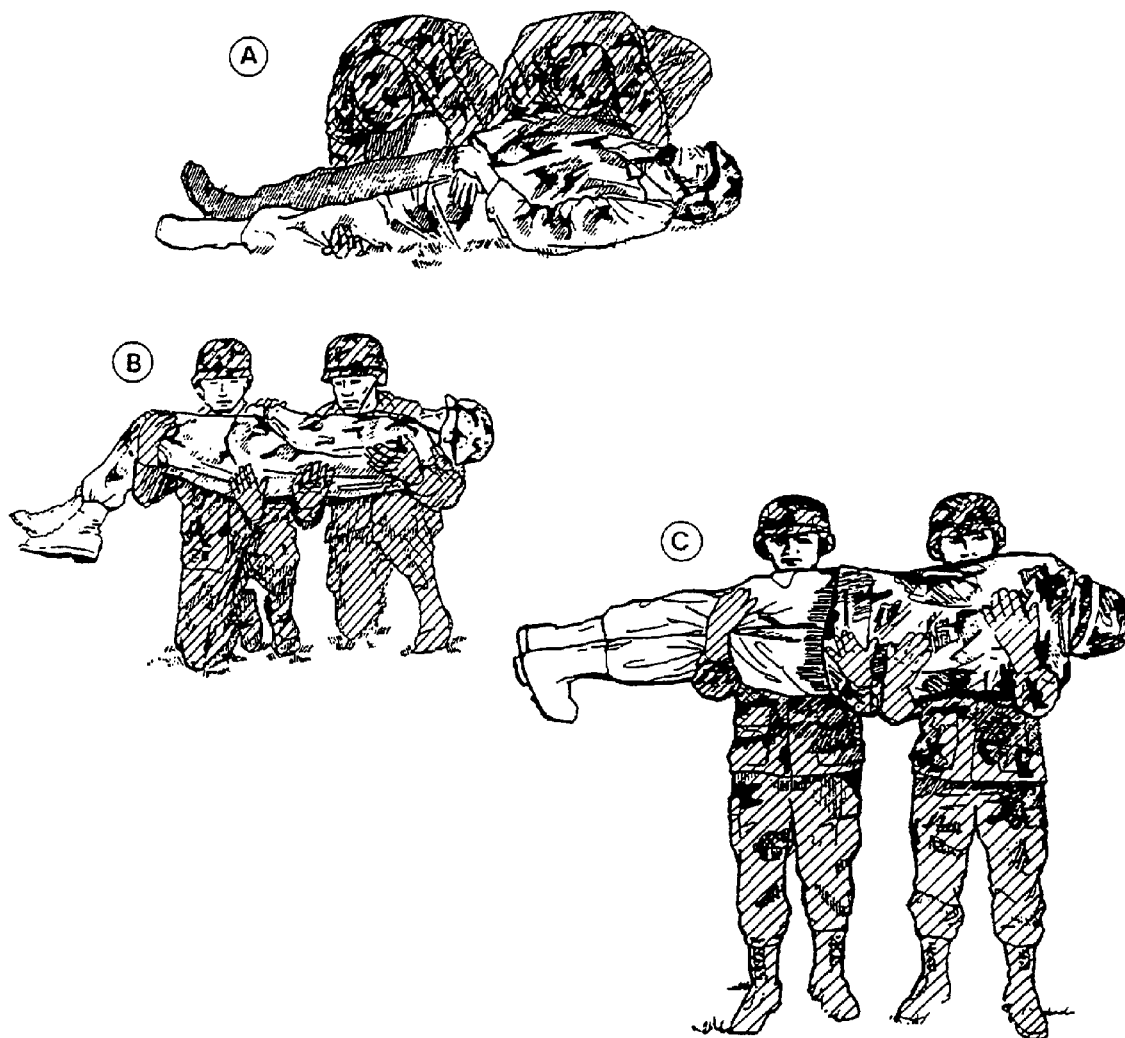


Figure G-17. Two-Man Arm Carry

(3) The two-man fore-and-aft carry (Figure G-18) is a useful two-man carry for transporting the casualty over a long distance (over 300 meters). The taller of the two bearers should position himself at the casualty's head. By altering this carry so that both bearers face the casualty, it is useful for placing a casualty on a litter.

(a) One bearer spreads the casualty's legs and kneels between them with his back to the casualty. He positions his hands behind the casualty's knees. The other bearer kneels at the casualty's head, slides his hands under the arms, across the chest, and locks his hands together.

(b) The two bearers rise together, lifting the casualty.

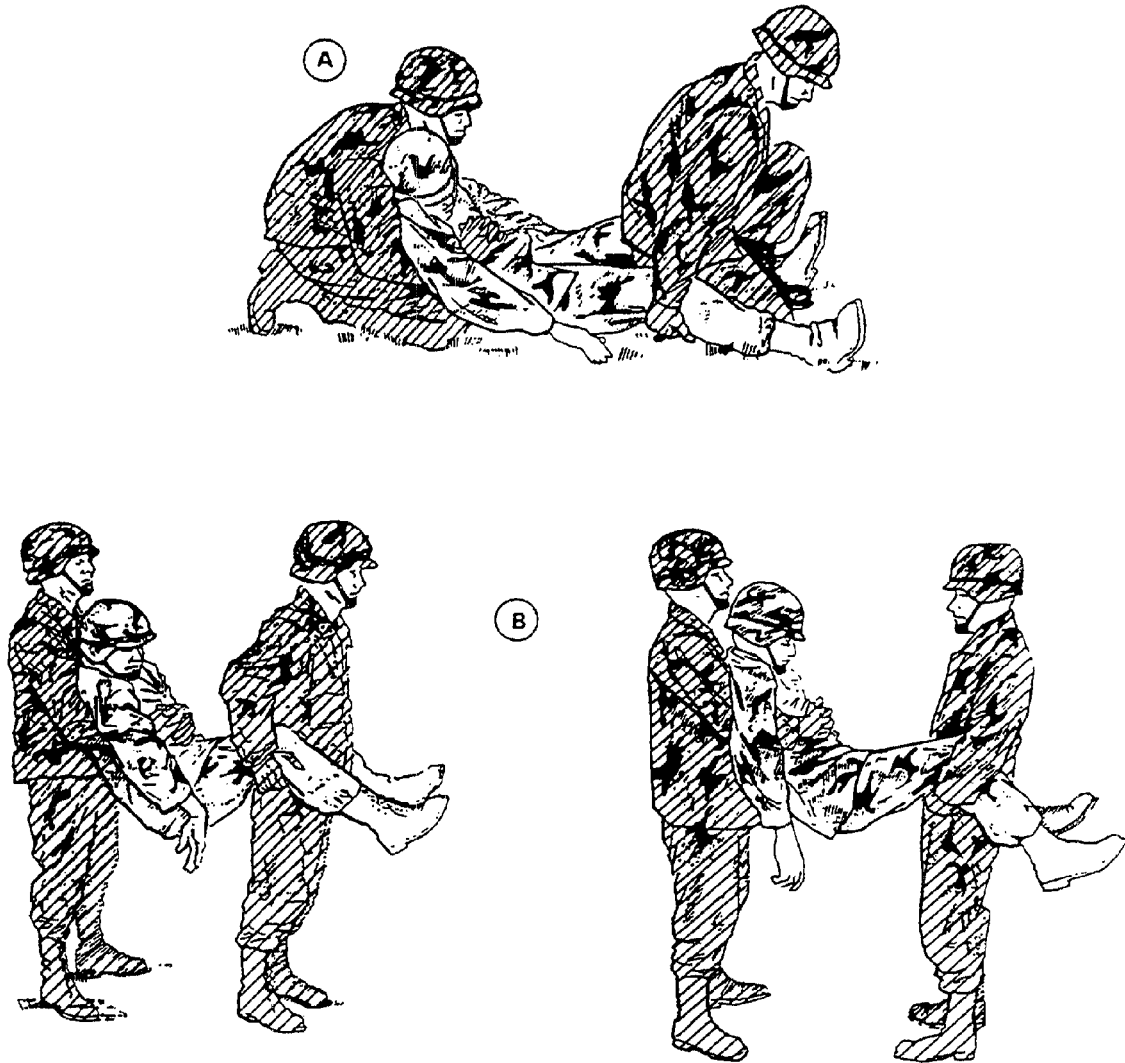


Figure G-18. Two-Man Fore-and-Aft Carry

(4) only a conscious casualty can be transported with the four-hand seat carry (Figure G-19) since he must help support himself by placing his arms around the bearers' shoulders. This carry is especially useful in transporting a casualty with a head or foot injury for a moderate distance (50 to 300 meters). It is also useful in placing a casualty on a litter.

(a) Each bearer grasps one of his wrists and one of the other bearer's wrists, thus forming a packsaddle.

(b) The two bearers lower themselves sufficiently for the casualty to sit on the packsaddle; then, they have the casualty place his arms around their shoulders for support. The bearers then rise to an upright position.

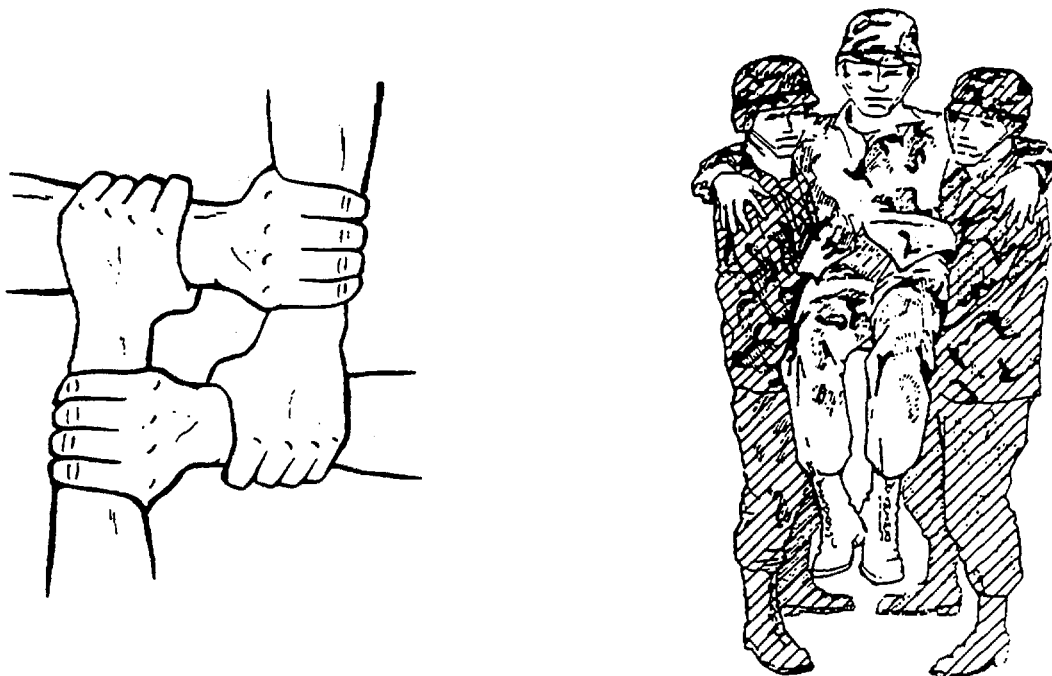


Figure G-19. Four-Hand Seat Carry

(5) The two-hand seat carry (Figure G-20) is used when carrying a casualty for a short distance (up to 50 meters) and in placing a casualty on a litter. With the casualty lying on his back, a bearer kneels on each side of the casualty at his hips. Each bearer passes his arms under the casualty's thighs and back, and grasps the other bearer's wrists. The bearers rise lifting the casualty.

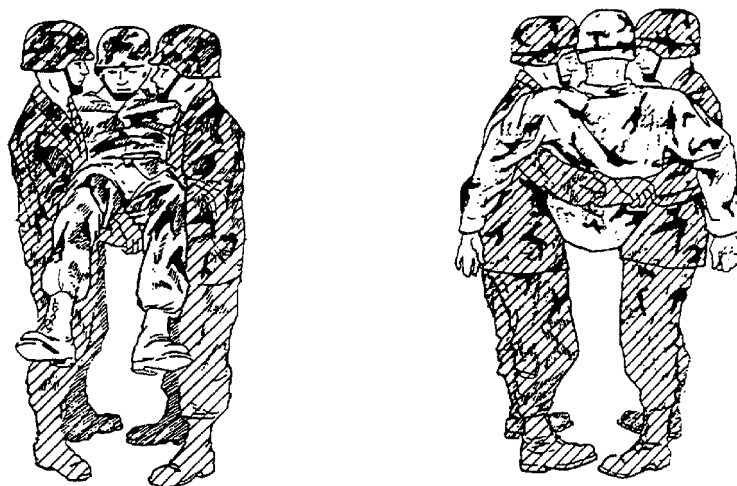


Figure G-20. Two-Hand Seat Carry

Section II

ARMY GROUND AMBULANCES

G-8. General.

a. Ground ambulances are vehicles designated for or converted to carrying patients. They are organic to HSS units which evacuate sick, injured, and wounded soldiers by ground ambulance. These vehicles are equipped with an MES designed for use in these ambulances.

b. They are staffed with a driver/medical aidman and an additional medical aidman who are both qualified in basic EMT procedures.

c. The Geneva Convention stipulates that ground ambulances be clearly marked with the distinctive emblem (red cross on a white background). To camouflage or not display this emblem will result in the loss of the protection afforded under this convention. Guidance on the camouflage of medical units, vehicles, and aircraft on the ground is contained in STANAG 2931 OP (paragraph B-2b).

G-9. Ground Ambulances.

Vehicles designed as ambulances include: field (wheeled) ambulances, the bus ambulance, and the M113 (track) armored personnel carrier.

a. Military field ambulances, designed for use by field units, operate on paved and secondary roads, trails, and cross-country terrain. Field ambulances operating in the forward areas of the CZ must possess mobility and survivability comparable to the units being supported. Current field ambulance variations include the M1010, HMMWV (M996 and M997), and M113. The M996 and M997 are normally used to evacuate patients from front line units to Battalion Aid Stations (BASs). The M792, M170, and M718 are being phased out of the inventory.

b. The bus ambulances are useful in transporting large numbers of patients within the COMMZ.

c. The M113, when configured with a litter kit, an NBC kit, and an MES, is classified as a standard evacuation vehicle and is therefore included in this section on ground ambulances.

G-10. Ambulance Driver.

The ambulance driver/medical aidman is responsible for the ambulance at all times. He performs driver maintenance on the vehicle and is responsible for reporting major deficiencies to his section chief or supervisor. When an additional medical

aidman is not assigned to the vehicle, the driver also performs aidman duties. The driver's responsibilities include:

a. Providing maximum safety and welfare for the patients entrusted to his care. This includes ensuring that the patient is secured to the litter prior to loading.

b. Ensuring operational readiness and responsiveness. This is accomplished by maintaining and being able to use the authorized equipment aboard the ambulance. This equipment includes:

- (1) Litters.
- (2) Blankets.
- (3) Splints.
- (4) Medical expendables.
- (5) Flashlights.
- (6) Auxiliary fuel.
- (7) Decontamination equipment.

c. Preparing the ambulance for loading and unloading.

d. Assisting the litter bearers in the loading and unloading of patients.

e. Performing property exchange when patients are loaded or unloaded.

f. Transporting medical supplies and authorized medical personnel.

g. Acting as a messenger in medical channels.

G-11. **Medical Aidman.**

The medical aidman acts as the assistant driver and his duties include:

a. Becoming familiar with the condition of each patient being evacuated and reviewing the information on the FMC.

b. Coordinating with the individual in charge for any special instructions in the care and treatment of the patients en route.

c. Providing EMT as required.

- d. Making periodic checks of patients while en route.
- e. Supervising and assisting in the proper loading and unloading of the ambulance.
- f. Assisting the driver with land navigation and guiding the driver when backing or moving off roads, or when under blackout conditions.

G-12. Ambulance Loading and Unloading.

In loading and unloading ambulances, litter patients are moved carefully. Details of the loading and unloading procedures vary slightly depending on the number of bearers, the presence or absence of a medical aidman, and the type of vehicle used.

a. General Procedures.

(1) Patients are normally loaded head first. The exception is if the nature of the patient's injuries make this inadvisable. They are less likely to experience motion sickness or nausea with the head in the direction of travel. They also experience less noise from the opening and closing of rear doors. There is less danger of injury to the patient if a rear-end collision occurs.

(2) When a patient requires en route care for an injury to one side of the body, it may be necessary to load him feet first to make the injured side readily accessible from the aisle. Patients with wounds of the chest or abdomen, or those receiving IV fluids, are loaded in lower berths to provide gravity flow. For ease of loading and patient comfort, those patients wearing bulky splints should be placed on lower berths, if possible.

b. Instructional Procedures. For loading and unloading the ambulances, the litter bearers are numbered and formal commands are given so that each individual can learn his particular job and work as a team.

(1) Loading Procedures. The sequence for loading four litter patients in the berths is upper right, lower right, upper left, and lower left. The most seriously injured are loaded last so they will be the first to be off-loaded. A three-man squad is required to load and unload the ambulance.

(2) Unloading Procedures. The sequence for unloading the ambulance is the reverse of the loading procedures: lower left, upper left, lower right, and upper right. A three-man squad is needed to unload the ambulance.

G-13. Truck, Ambulances, 4x4, Armored, M996 and M997.

The M996 and M997 armored ambulances are tactical vehicles designed for use over all types of roads, as well as cross-country terrain. It can also operate in all weather conditions (Figure G-21). These ambulances are diesel-powered and equipped with four-wheel hydraulic service brakes. The ambulances can be heated and ventilated. Only the M997 can be air-conditioned. Supplemental electrical power to operate the life support equipment is also available. For operations in an NBC environment, the M996 and M997 ambulances are equipped with a Gas-Particulate Filter Unit (GPFU).

a. Patient Carrying Capacities. Refer to Table G-1 for the various patient carrying capacities.

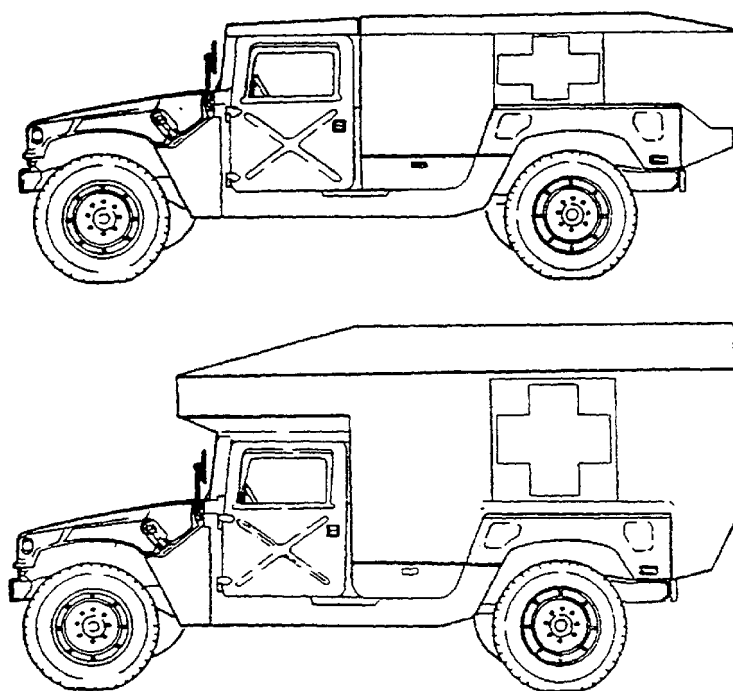


Figure G-21. Trucks, Ambulance, 4x4, Armored, (M996 and M997)

Table G-1. Patient Carrying Capacities.	
Truck, Ambulance, 4x4 2 Litter, Armored (M996)	Truck, Ambulance, 4x4 4 Litter, Armored (M997)
2 Litter Patients	4 Litter Patients
6 Ambulatory Patients	8 Ambulatory Patients
1 Litter and 3 Ambulatory Patients	2 Litter and 4 Ambulatory Patients

b. Two-Litter Configuration, M996. The sequence for loading patients in the berths is right first then left. The most seriously injured patient is loaded last so that he is the first to be taken out of the ambulance. The sequence for unloading is the reverse of loading.

NOTE

The numbers used in the explanation of the figures correspond to the parts/equipment represented in the graphic.

(1) Assembling litter rail extension (Figures G-22 and G-23).

(a) Turn latch #1 counterclockwise and open stowage compartment door #2.

(b) Loosen and disconnect securing strap #3 and remove folded litter rail extension #4 from stowage compartment #5.

(c) Pull left and right rails #6 apart and let legs #11 drop down. Ensure feet #12 are flat on ground.

(d) Lock support braces #13 and adjust straps #14 as necessary.

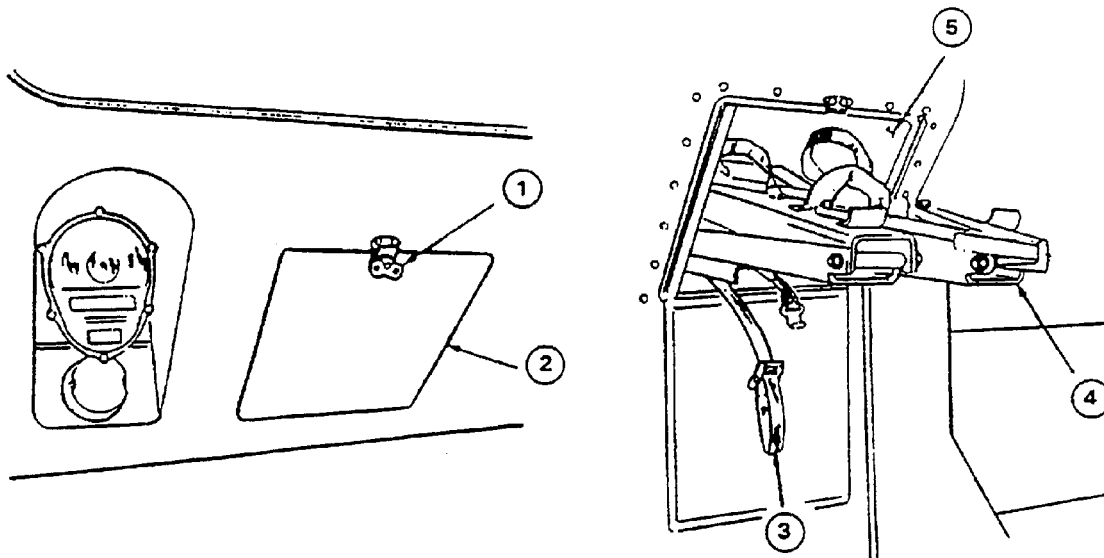


Figure G-22. Litter Rail Extension Stowage Compartment, M996

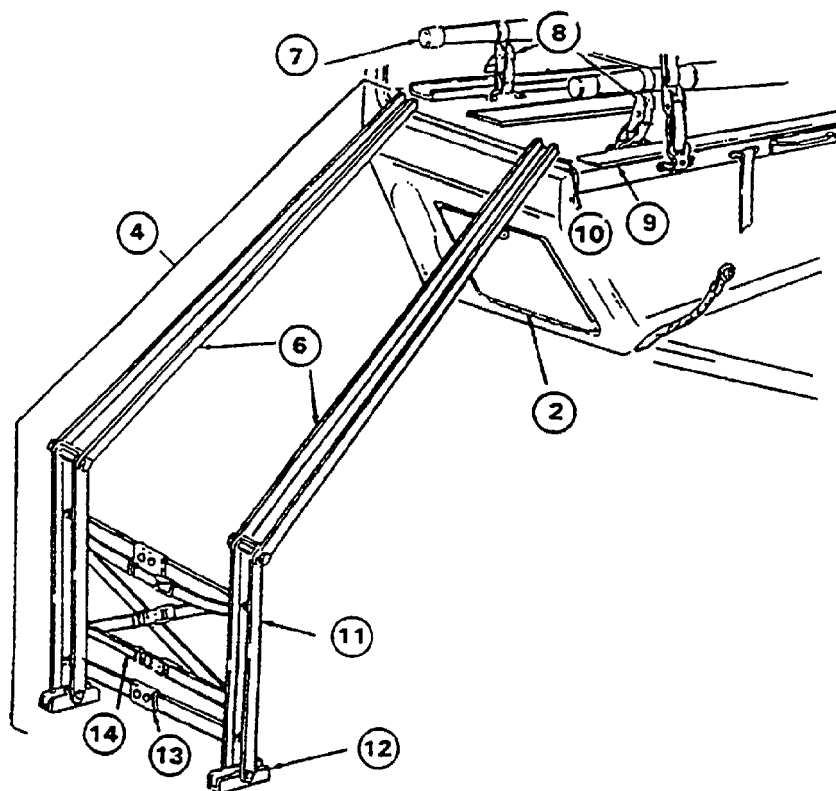


Figure G-23. Litter Rail Extension

(2) Loading litters on litter rack (Figure G-23).

(a) Secure both rails #6 of litter rail extension #4 into slots #10 on litter rack #9.

(b) Place litter #7 on litter rail extension #4.

WARNING

Ensure straps and equipment do not inhibit litter loading operations. Load litters carefully to prevent further injury to casualty.

(c) Slide litter #7 onto litter rack #9.

(d) secure litter #7 to litter rack #9 with front and rear litter handle straps #8.

(3) Unloading litters from the litter rack (Figure G-23).

(a) Release front and rear litter handle straps #8 securing litter #7 to litter rack #9.

(b) Secure both rails #6 of litter rail extension #4 into slots #10 on lower litter rack #9.

(c) Slide litter #7 from lower litter rack #9 onto litter rail extension #4. Lift up and remove litter #7 from litter rail extension #4.

(4) Fold and stow litter rail extension (Figures G-22 and G-23).

(a) Unlock support braces #13.

(b) Fold left and right rails #6 together.

(c) Fold left and right litter rail legs #11 and feet #12 against rails #6.

(d) Place folded litter rail extension #4 into stowage compartment #5 and secure with strap #3.

(e) Close door #2 and turn latch #1 clockwise to secure door #2.

(5) Opening patient seat to accommodate ambulatory casualties.

(a) Ensure litters are in stowed positions.

(b) Pull out and up on seat latch handle #5 and remove latch #7 from catch #6.

(c) Lift seat back #4 to open position and fold seat back support #2 into recesses between seat cushions #9.

(d) Ensure that seat braces #8 are fully extended and locked in position.

(6) Closing the patient seat to accommodate litter patients.

(a) Press lock buttons #12 on seat braces #8 and fold braces #8 toward seat back #4.

(b) Fold seat back support #2 outward and fold seat back #4 into closed position. Ensure that guide pins #11 on seat back support engage holes #10 in seat base #3.

(c) Install seat back #4 to seat base #3 with seat latch #7 and secure with latch handle #5. If necessary, to

ensure security of seat back #4, adjust seat latch #7 to proper length by turning clockwise or counterclockwise.

c. Four-Litter Configuration, M997. The sequence for loading four litter patients in the berths is upper right, lower right, upper left, and lower left. The most seriously injured patients are loaded last so they are the first to be taken out of the ambulance. The sequence for unloading is the reverse of the loading procedure: lower left, upper left, lower right, and upper right. When only two litter patients are to be loaded, the upper and lower right side berths are used. Using the two right side berths leaves the left side unoccupied for use in transporting ambulatory or additional litter patients.

NOTE

When casualties are picked up from several locations, the loading sequence of least seriously injured casualty to most injured casualty cannot always be applied. A previously loaded casualty should not be unloaded in order to maintain the loading sequence. The receiving MTF must be made aware of the most seriously injured casualty.

WARNING

When loading more than two litter patients, the upper litter rack patient must be loaded first. Injury may result if litter patients are loaded in lower rack first.

(1) Preparing the upper litter rack (Figure G-24).

(a) Unhook tension strap #23 from footman loop #30 on lower litter rack #9.

WARNING

The rear end of the upper litter must be supported before releasing the suspension strap hook. Injury to personnel may result if rear end of upper litter is not supported.

(b) Pull out upper litter rack handle #17 and support weight of upper litter rack #21.

(c) Unhook rear suspension strap hook #27 from loop #22 on upper litter rack #21. Clip suspension strap hook #27 to eye #26.

(d) Release litter support latch stop #25, push latch #24 in, and lower upper litter rack #21 onto lower litter rack #9.

(e) Slide litter rack handle #17 into upper litter rack #21.

(2) Assembling litter rail extension (Figures G-23 and G-25).

(a) Turn latch (1) counterclockwise and open stowage compartment door #2.

(b) Loosen and disconnect securing strap #3 and remove folded litter rail extension #4 from stowage compartment #5.

(c) Lift tray #15 slightly and push in tray supports #16 to lower tray #15 for access to stowed litters.

(d) Pull left and right rails #6 apart and let legs #11 drop down. Ensure feet #12 are flat on ground.

(e) Lock support braces #13 and adjust straps #14 as necessary.

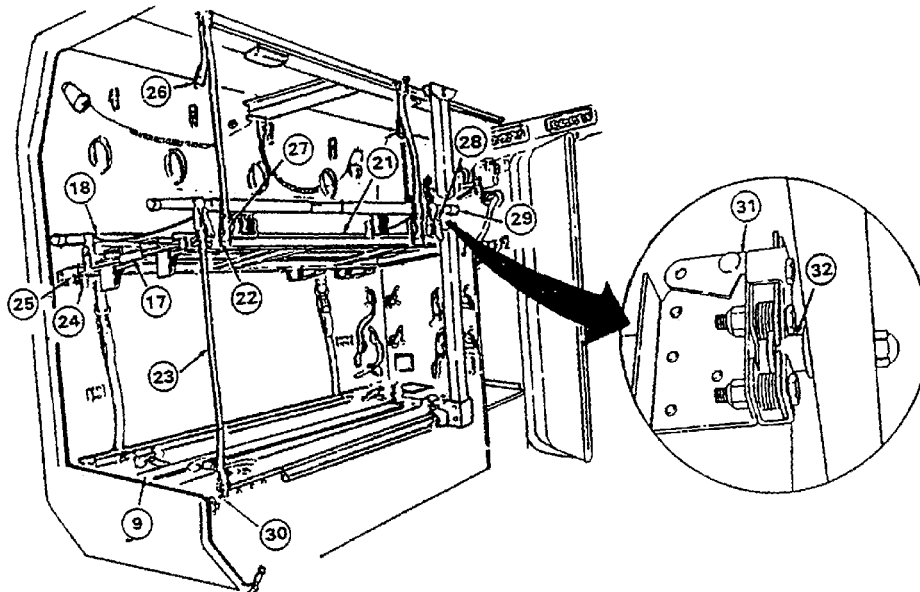


Figure G-24. Interior, M997

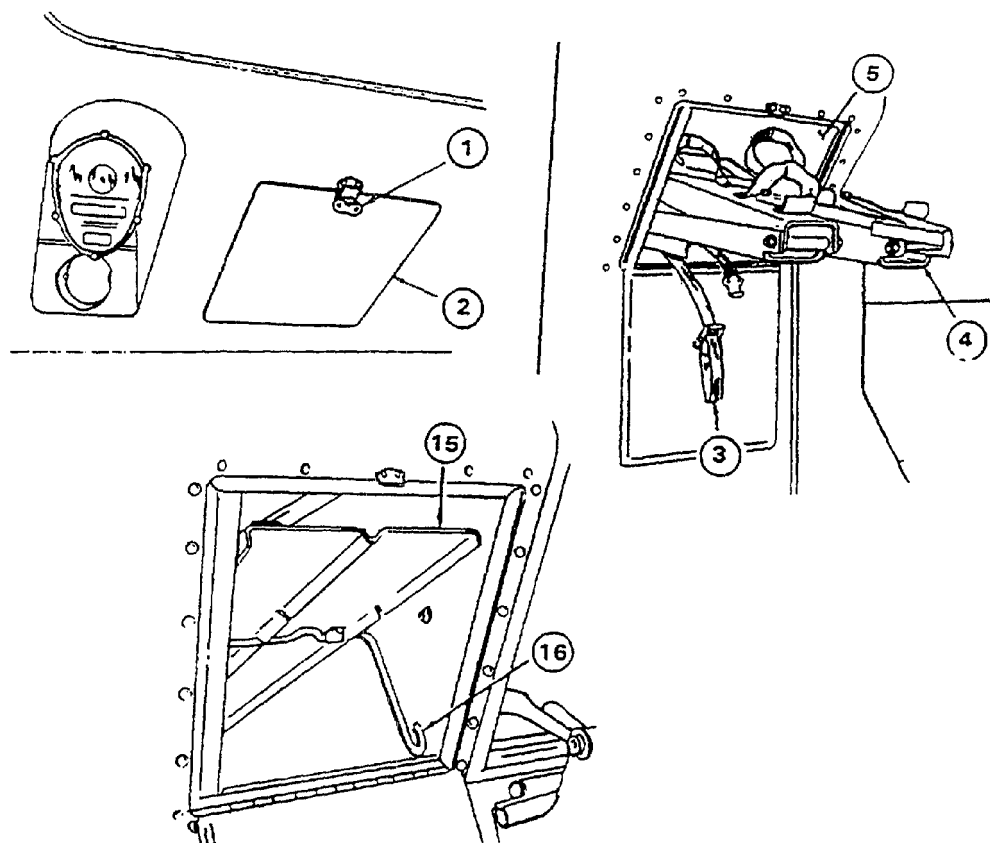


Figure G-25. Litter Rail Extension Stowage Compartment

(3) Loading litters on upper litter racks (Figures G-26 and G-28).

(a) Secure both rails of litter extension #14 into slots in upper rack #21.

(b) Place litter #18 on litter rail extension #4.

(c) Slide litter #18 up rails #4 until litter #18 is clear of litter rail extension #4.

(d) Secure rear litter handles #19 to upper litter rack #21 with rear litter handle straps #20.

(e) Remove litter rail extension #4 from upper litter rack #21.

(f) Unhook suspension strap hook #27 from eye #26.

- (g) Pull out upper litter rack handle #17.
 - (h) Raise upper litter rack #21, push into litter support latch #24, and secure with latch stop #25.
 - (i) Attach suspension strap hook #27 to loop #22 on upper litter rack #21.
 - (j) secure front litter handles #29 to litter rack #21 with front litter handle straps #28.
 - (k) Hook tension strap #23 to footman loop #30 on lower rack #9 and adjust strap.
 - (l) Slide litter rack handle #17 into upper litter rack #21.
- (4) Loading litters on lower litter rack (Figure G-23).
- (a) Secure both rails #6 of litter rail extension #4 into slots #10 on lower litter rack #9.
 - (b) Place litter #7 on litter rail extension #4.
 - (c) Slide litter #7 onto lower litter rack #9.
 - (d) Secure litter #7 to lower litter rack #9 with front and rear litter handle straps #8.
- (5) Unloading litters from the lower litter rack (Figure G-23).

WARNING

When unloading more than two litter patients, lower litter rack patients must be unloaded first. Ensure that straps and equipment do not inhibit unloading operations. Unload litters carefully to prevent further patient injury.

- (a) Release front and rear litter handle straps #8 securing litter #7 to lower litter rack #9.
- (b) Secure both rails #6 of litter rail extension #4 into slots #1 on lower litter rack #9.
- (c) Slide litter #7 from lower litter rack #9 onto litter rail extension #4. Lift up and remove litter #7 from litter rail extension #4.

(6) Unloading litters from upper litter racks (Figure G-26 and G-28).

(a) Release front litter handle straps #28 from litter handles #29.

(b) Unhook tension strap #23 from footman loop #30 on lower litter rack (9).

(c) Pull out upper litter rack handle #17 and support weight of upper litter rack #21.

(d) Unhook rear suspension strap hook #27 from loop #22 on upper litter rack #21. Clip suspension strap hook #27 to eye #26.

(e) Release litter support latch stop #25, push latch #24 in, and lower upper litter rack #21 onto lower litter rack #9.

(f) Slide litter rack handle #17 into upper litter rack #21.

(g) Secure rails of litter rail extension #4 into slots in upper litter rack #21.

(h) Release rear litter handle straps #20 from litter handles #19.

(i) Slide litter #18 down litter rail extension #4 until litter #18 is clear of upper litter rack #21.

(j) Lift and remove litter #18 from litter rail extension #4.

(k) Remove litter rail extension #4 from upper litter rack #21.

(7) Fold and stow litter rail extension (Figure G-23 and G-25).

(a) Unlock support braces #13.

(b) Fold left and right rails #6 together.

(c) Fold left and right litter rail legs #11 and feet #12 against rail #6.

(d) Lift tray #15 and push tray supports #16 in, and lower tray #15.

(e) Slide litters into stowage compartment #5 on top of lift tray #15. Pull out supports #16 to place lift tray #15 in raised position.

(f) Place folded litter rail extension #4 into stowage compartment #5 and secure with strap #3.

(g) Close door #2 and turn latch #1 clockwise to secure door #2.

(8) Folding upper litter rack to the backrest position (Figure G-24).

(a) Unhook litter rack tension strap #23 from lower litter rack footman loop #30.

(b) Unhook two upper litter rack suspension straps hooks #27 from loops #22 on upper litter rack #21 and reattach strap hooks #27 to eyes #26.

(c) Release upper litter rack latch #31 and disengage rack striker #32 from latch #31.

(d) Lower upper litter rack #21 onto the lower litter rack #9, forming a backrest.

(9) Converting backrest to upper litter rack (Figure G-24).

(a) Raise upper litter rack #21 and engage rack striker #32 into upper litter rack latch #31. Ensure striker #32 is locked in latch #31.

(b) Unhook two upper litter rack suspension strap hooks #27 from eyes #26 and hook to loops #22 on upper litter rack #21.

(c) Hook upper litter rack tension strap #23 to footman loop #30 on lower litter rack #9.

(d) Adjust straps #23 and #27 for proper tension.

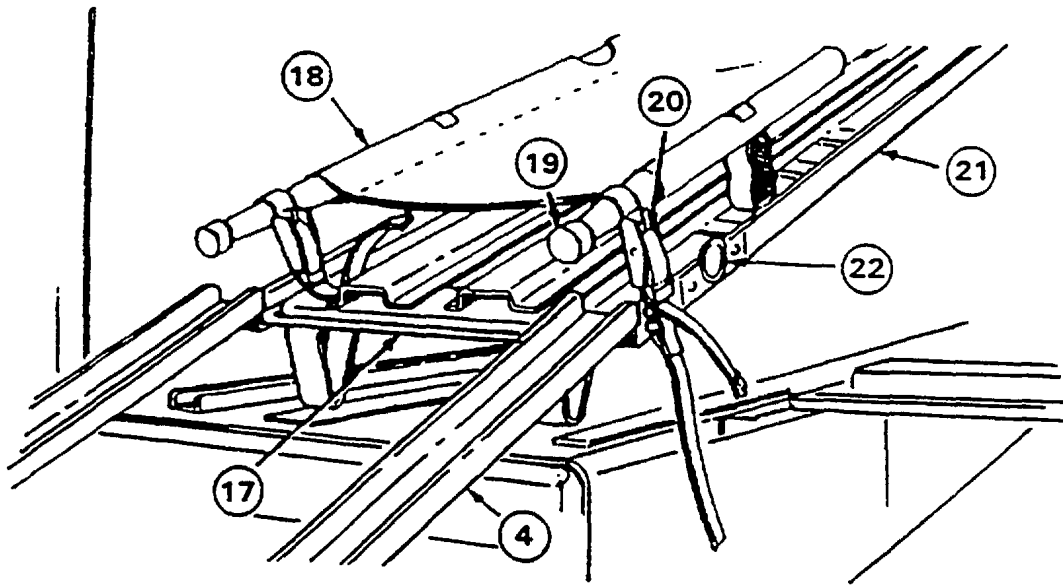


Figure G-26. Upper Litter Rack

G-14. Truck, Ambulance, 1 1/4 Ton, 4x4, M1010.

The M1010 truck, Ambulance, is a diesel-powered vehicle equipped with power steering and brakes and automatic transmission. It can accommodate up to four litters or eight ambulatory patients, or a combination of each. The vehicle has a patient assist boom, and block and tackle for loading. An improved patient life support capability is provided by four additional focus-type lights, air conditioning, optional gas particulate filler unit (GPFU) for NBC protection, and supplemental electrical power to operate the life-support equipment. The M1010 also has additional storage space between the litter berths and vehicle cab. The loading sequence is upper right, lower right, upper left, and lower left. In an emergency or mass casualty situation, one additional litter can be placed in the center aisle.

G-15. Truck, Ambulance, 1 1/4 Ton, 6x6, M792.

The M792 truck, ambulance, can accommodate three litter patients and a medical attendant, two litter patients, three ambulatory patients, and a medical attendant, or six ambulatory patients. Due to the ridge characteristics of the vehicle, all litter patients must be securely strapped in place. The sequence for loading the berths is upper right, upper left, and lower, with the unloading sequence accomplished in reverse order. A two-man squad is required for loading and unloading the vehicle.

G-16. Track, Ambulance, 1/4 Ton, 4x4, M718, Frontline.

The M718 truck ambulance, has no storage compartment, blackout curtains, or additional lights. A three-man squad is required for loading and unloading the vehicle, which can safely accommodate a driver and three or four other persons. This vehicle can be configured for:

a. Three litter patients in the upper left, upper right, and center berths. In this situation, the attendant must remain at the pickup site since the right front seat is placed against the instrument panel to make space for the upper right and center berths. This allows the driver to observe the most severe patients.

b. Two litter patients in the upper right and center berths and one ambulatory patient and the attendant seated on the left side. When the center berth (placed diagonally) is occupied, seating space on the left side is adequate for only two persons.

c. The attendant in right front seat and three ambulatory patients seated on the left side. The right side is used to store unused berths and litters.

G-17. Track, Ambulance, 1/4 ton, 4x4, M170, Frontline.

The M170 ambulance has no storage compartment, blackout curtains, or additional lighting. It can accommodate three litter patients, two litter patients and three ambulatory patients, or five ambulatory patients. A three-man squad is required for loading and unloading. The sequence for loading three litter patients in the berths is upper right, lower right, and left.

CAUTION

Serious accidents can occur from overloading this 1/4-ton vehicle. It is a modification of the M151 Utility Vehicle and is not designated to carry heavy loads.

G-18. Buses (Ambulances).

These vehicles can be rapidly converted into ambulances (Figures G-27 and G-28). They can be used in support of the Army in the field as far forward as the road network and tactical situation permit. They are most useful in situations where a large number of patients are to be transported for relatively short distances over improved roads, such as transferring patients from hospitals to airheads and ports of embarkation.

a. Patient Carrying Capacity. Ambulance buses have various patient carrying capacities. Total capacity for litter and ambulatory patients depends on the size of the available bus. A kit containing the necessary accessories for conversion is located in the compartment on the right outside of the bus body.

b. Vehicle Conversion. To convert the bus to an ambulance, it may be necessary to remove all seats except those immediately behind the driver. The seats behind the driver are used for medical attendants or ambulatory patients. Litter support hooks are inserted in brackets located at the top and bottom on the interior of the body side. Litter support hangers are then suspended from the hooks in the ceiling rails. To return the vehicle to passenger operation, the procedure is reversed. In some buses, conversion can be done by folding down the seat backs.

c. Loading Procedures. Normally, two three-man litter squads are required to load and unload the bus ambulance. The vehicle is loaded from front to rear and from top to bottom. All patients are loaded into the bus with their heads toward the front of the vehicle unless the injury dictates using a different loading technique.

(1) Loading from ramps or platforms. Two litter teams are required to load the bus. One litter team enters the rear of the bus with a litter patient, loads the patient on the berth, and exits through the front as the second team enters through the rear with a litter patient. The second team loads its patient and exits through the front as the first team enters the rear with its second patient. Only one of the teams is in the bus at a time, thereby avoiding interference.

(2) Loading without ramps or platforms. Two litter teams are used to load the bus from the ground. One litter team remains in the bus. A second litter team loads patients onto the bus floor at the rear of the bus where they are picked up by the team in the bus and loaded onto berths.

d. Unloading Procedures. Patients are unloaded (in reverse order of loading procedure) from rear to front and from bottom to top. Two litter teams are also required to unload the bus.

(1) When the vehicle is to be unloaded from loading ramps or platforms, the two litter teams alternate in unloading.

(2) When the vehicle is to be unloaded without ramps, one litter team removes the litter patients from the berths in the bus and places them on the floor at the rear of the bus where they are picked up and unloaded by the second litter team.

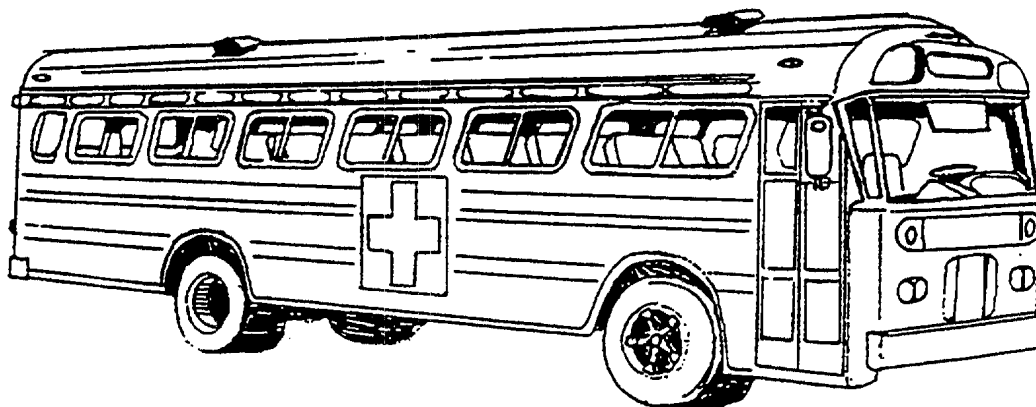


Figure G-27. Bus Ambulance, Exterior View

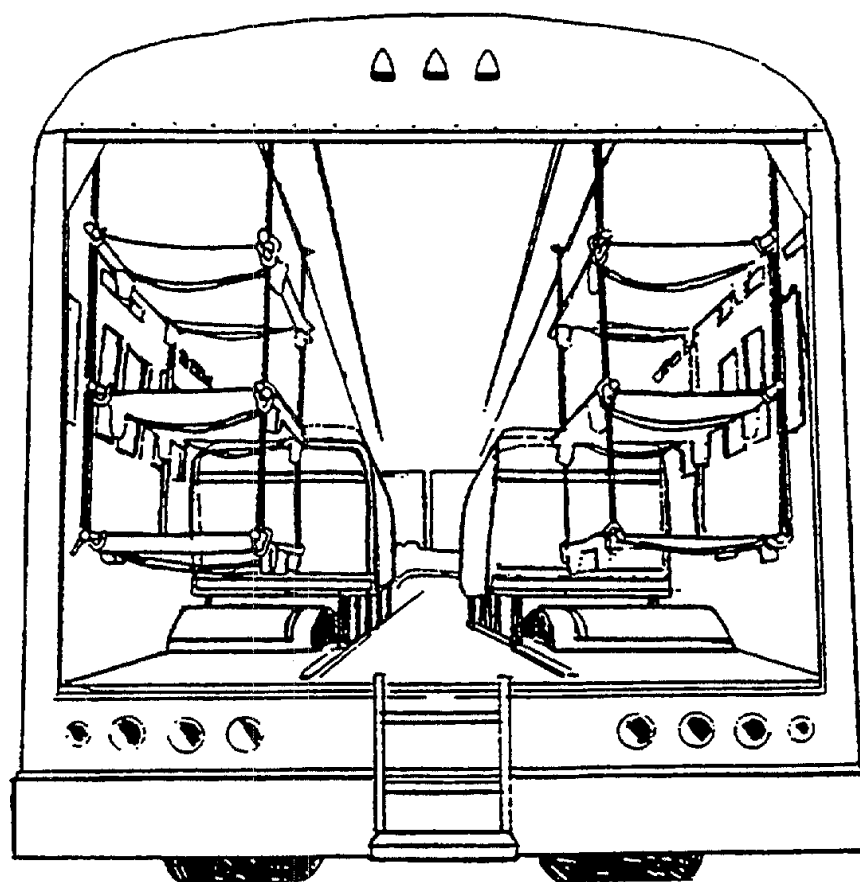


Figure G-28. Bus Ambulance, Interior View,
Seats Removed and Litters Installed

G-19. Carrier, Personnel, Full-Track, Armored, M113, T113E2.

The M113 armored personnel carrier (Figure G-29) is a standard evacuation vehicle. It is lightly armored to afford patient protection against small arms. Wearing the helmet inside the vehicle provides added protection, especially over rough terrain, due to the low silhouette. Movement of the tracks propels and steers the vehicle. It is highly maneuverable and capable of:

- a. Amphibious operations on inland lakes and streams.
- b. Extended cross-country travel over rough terrain.
- c. High-speed operations on improved roads and highways.

(1) The vehicle can carry ten ambulatory-patients and has a conversion kit which, when installed, gives a normal capacity of four litter patients.

(2) A squad of four men is needed to load and unload the vehicle. The sequence for loading four litter patients is upper right, lower right, upper left, and lower left.

CAUTION

To install the litter suspension kit in the M113 ambulance, the spall liner must be removed. Litter patients cannot be safely moved if the litter suspension kit is not installed.

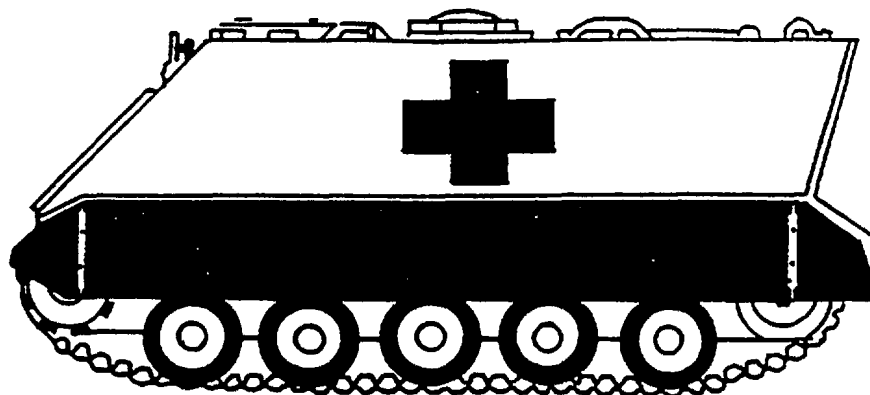


Figure G-29. Carrier, Personnel, Full-Track, Armored, M113

Section III

NON-MEDICAL VEHICLES USED FOR PATIENT TRANSPORT AND MEDICAL EVACUATION

G-20. General.

a. In combat areas, ambulances are often unavailable, are too few in number, or are incapable of evacuating patients over certain types of terrain. In these instances, many vehicles available to most units can be used to transport casualties with little or no change in their configuration. Some amphibious cargo and personnel vessels can be used for this purpose; however, their patient-carrying capacity varies.

b. When casualties have entered the HSS system, they are classified as patients. Patient evacuation includes providing en route medical care to the patient being evacuated; however, if a patient is moved on a non-medical vehicle without en route medical care, he is considered to be transported, not evacuated.

G-21. Patient Transport and Patient Evacuation in a Mass Casualty Situation.

To provide timely and responsive evacuation or patient transport, HSS planners develop pro-active OPLANS to meet the challenges of a mass casualty situation.

a. Contingency plans should identify:

- (1) Non-medical transportation resources.
- (2) Evacuation routes.
- (3) Ambulance exchange points.
- (4) Medical personnel resources to provide en route medical care on non-medical vehicles.
- (5) Capabilities and locations of MTFs.
- (6) Communications frequencies and call signs for command and control.
- (7) Procedures for medical equipment exchanges.
- (8) Key players in coordinating the use of non-medical vehicles for medical evacuation or patient transportation are contained in Table G-2.

b. Ground non-medical assets can be used for patient transport when the medical evacuation system is overwhelmed. All available ground vehicles should be considered for augmenting

medical evacuation assets in an emergency. The key to success is identifying the vehicles, drivers, and medical personnel or combat lifesavers who will accompany the casualties. Coordinating for the release of these assets upon demand rather than waiting for a mass casualty situation to occur is also crucial to the success of the operation. Vehicle types will differ depending upon the type of unit supported; however, some of the more common vehicles which may be used are the:

- (1) Bradley infantry fighting vehicle, M2/3.
- (2) Light weapons carrier, M274.
- (3) Truck, cargo, 1 1/4 ton, M880/890 and M1008.
- (4) Truck, cargo, 2 1/2 ton, M35.
- (5) Truck, cargo, heavy expanded, mobility tactical truck (HEMTT), 8x8, cargo, M977.
- (6) Semi-trailer, cargo, 22 1/2 ton, M871.
- (7) Truck, cargo, 5 ton.
- (8) Truck, utility, M151.
- (9) Armored personnel carrier, M113.
- (10) Tractor, 5 ton, with stake and platform trailer.
- (11) High-mobility, multi-purpose wheeled vehicle, M998.

c. Depending on the theater of operations, host-nation support agreements may provide evacuation assets ranging from austere to extensive support. Coordination with the G5 can provide information on the availability of assets. This information should be included in the OPLANs. Some of the types of assets which might be available for support are:

- (1) Buses.
- (2) Ambulance railcars.
- (3) Barges and other watercraft.
- (4) Civilian cargo vehicles.

d. The staffing of non-medical vehicles with medical personnel to provide en route medical care requires considerable planning and coordination. Since non-medical vehicles are normally ones of opportunity, attendants, medical equipment, and transportation platforms must be carefully tracked if they are to

be used. The modular medical system lends itself well to this form of task organizing by providing four-man trauma treatment teams with equipment organic to the Forward Support Medical Companies (FSMCs) and Main Support Medical Companies (MSMCs). These same treatment modules are also found in the corps Area Support Medical Companies (ASMCs). Health service support managers should plan to use these assets in this temporary role. Also available within the Combat Support (CS) and Combat Service Support (CSS) units of the division, are trained combat lifesavers and their MES (aid bags). These personnel can be used, if available, to provide en route surveillance of less seriously injured patients.

e. The management of patient evacuation using non-medical evacuation assets is difficult to control. over-evacuation occurs routinely unless controls are implemented to manage the evacuees by patient category. Responsive evacuation is extremely important; however, if en route, patient care and management by patient category are ignored, the end result will be an increase in the mortality rate and an overevacuation of RTD soldiers. URGENT and URGENT-SURG precedence patients should be evacuated before PRIORITY, ROUTINE, or CONVENIENCE precedence patients. Care must be taken to ensure lower precedence patients are evacuated before their medical condition begins to deteriorate resulting in upgrading their precedence to URGENT or URGENT-SURG. The preferred means of evacuating URGENT and URGENT-SURG precedence patients is by air ambulance. If ground ambulance is used for URGENT and URGENT-SURG patients, the patients must be checked frequently to ensure that their medical condition is not deteriorating and rendering them non-transportable. Planners should consider and incorporate into the OPLAN the use of non-medical air assets and dedicated ground ambulances to move the PRIORITY patient, and non-medical ground vehicles to move the ROUTINE precedence patients when dedicated medical vehicles are not available. Every effort should be made to staff and equip non-medical vehicles used for patient evacuation with medical personnel, even if only to move the ROUTINE patient precedence category.

f. Coordination for the use of non-medical transportation resources is depicted in Table G-2.

Table G-2. Coordination Requirements for Nonmedical Transportation and Medical Augmentation to Provide En Route Medical Care				
Element Requiring Support	Type of Transportation	Coordinate Transportation With	Medical Augmentation for En Route Medical Care Coordinated With	
Company Aid Post	Ground	Company	Battalion Aid Station	
Battalion Aid Station	Ground	Maneuver Battalion S4	*FSMC	
Clearing Station (BSA)	Ground Air	DMOC-MCO DMOC, G3 Air	*MSMC *MSMC	
Clearing Station (DSA)	Ground Air	DMOC-MCO DMOC, G3 Air	*Corps Med Gp Bde ASMB Unit *Corps Med Gp Bde ASMB Unit	
Engineer Battalion Company	Ground Air	FSB Spt Ops FSB Spt Ops, G3 Air	*FSMC *MSMC *FSMC *MSMC	
Field Artillery Battalion, Battery	Ground Air	FSB MSB Spt Ops FSB MSB Spt Ops, G3 Air	*FSMC *MSMC *FSMC *MSMC	
Other Units - without organic medical support operating in division area	Ground Air	DMOC-MCO, Corps MCT DMOC, G3 Air	*FSMC *MSMC *FSMC *MSMC	
<p>* In coordination with DMOC, if applicable</p> <p>LEGEND</p> <div> <div>ASMB: Area Support Medical Battalion</div> <div>BSA: Brigade Support Area</div> <div>DSA: Division Support Area</div> <div>DMOC: Division Medical Operations Center</div> <div>DTOP: District Transportation Office</div> <div>FSB: Forward Support Battalion</div> <div>FSMC: Forward Support Medical Company</div> <div>MCO: Movement Control Officer</div> <div>MCT: Movement Control Team</div> <div>MSB: Main Support Battalion</div> <div>MSMC: Main Support Medical Company</div> </div>				

G-22. Carrier, Light Weapons, Infantry, 1/2 Ton, 4x4, M274.

This vehicle is designed to carry light cargo over rough terrain at slow speeds. This vehicle has a very low silhouette. The vehicle consists of a platform on which the driver's seat is mounted. The small size and cross-country mobility of this vehicle make it a good choice for a patient carrier for forward units (Figures G-30 through G-32). It is easily loaded with litters; however, the casualties must be lashed securely to the litters and the litters must be secured to the vehicle. The carrier can transport as many as three litter casualties, placed across the body of the vehicle. The most satisfactory method of using this vehicle for transporting casualties is to place two litters lengthwise on the vehicle. A two-man team is used for loading.

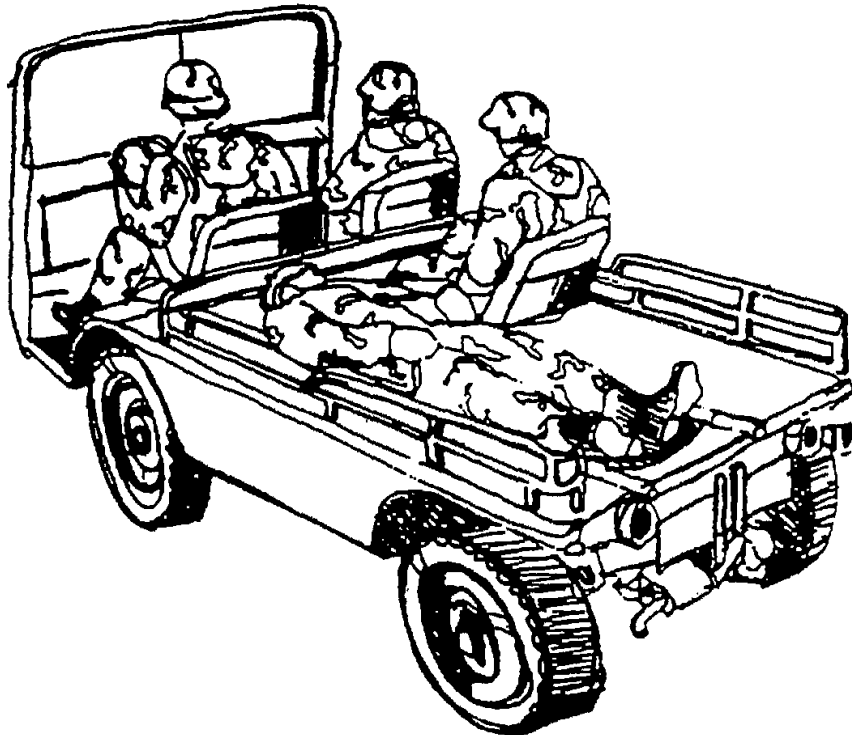


Figure G-30. Transporting One Patient

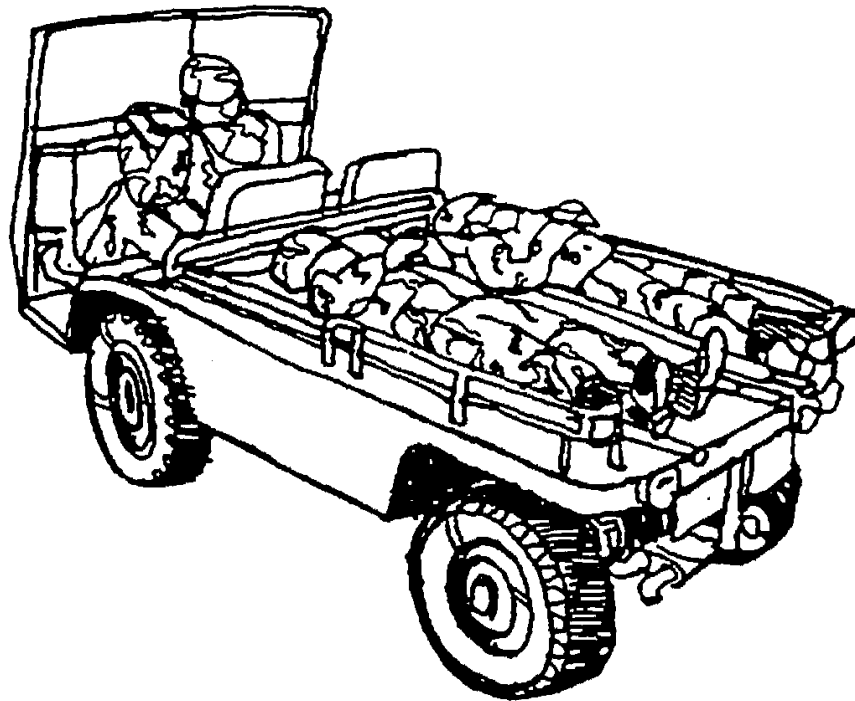


Figure G-31. Transporting Two Patients

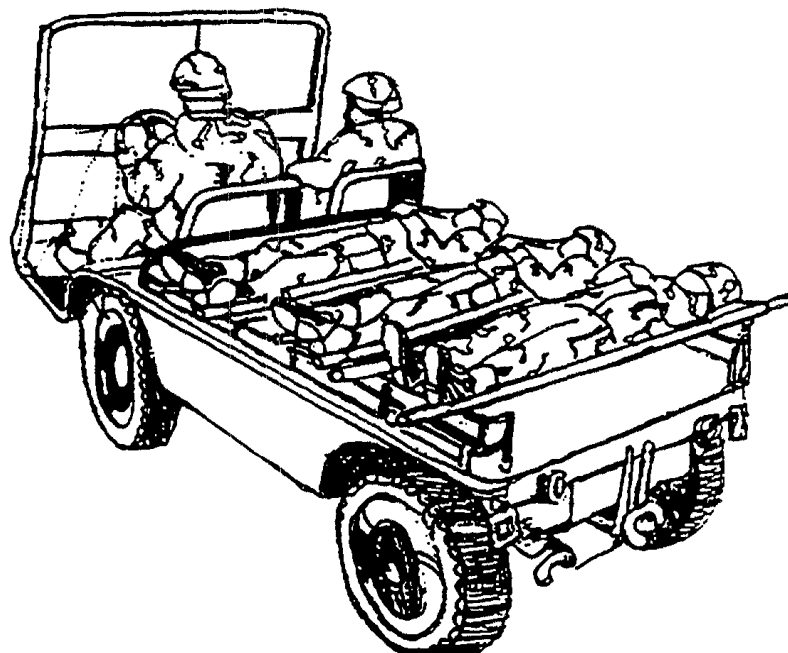


Figure G-32. Transporting Three Patients

G-23. Track, Utility, 1/4 Ton, 4x4, M151.

This 1/4-ton truck, designed for maneuverability and close support, is used in forward areas as a general purpose personnel or cargo carrier. It has an open-type body with four-passenger capacity. The 1/4-ton, two-wheel trailer, M115, is designed for use with the 1/4-ton truck. The truck and trailer are standard equipment in the medical company as well as many other units of the Army. They are usually readily available and can be easily converted to patient carriers without alteration or additional equipment (Figure G-32). Two litters can be transported on the truck and two on the trailer. The following procedures apply to the loading of this vehicle:

a. Place the first litter across the back of the truck with the litter handles resting on the sides of the truck.

b. Place the second litter lengthwise on the right side of the truck with the rear handles resting on the side of the first litter. The front stirrups fit into the groove below the windshield.

NOTE

When the route of evacuation is along narrow roads or trails, care must be taken to prevent the litter handles from catching on trees and bushes.

NOTE

The second litter may be placed so that the front handles rest on the windshield frame and the rear handles straddle the spare tire, thus positioning it above the first litter.

c. Securely lash the litters to the vehicle.

d. If a trailer is available, place two litters lengthwise on it and bind the handles of the litters to the small hooks on the sides of the trailer.

G-24. Truck, Cargo, 1 1/4 Ton, 4x4/4x2, M880/890 and M1008.

The 1 1/4-ton cargo truck (Figure G-33) is a lightweight, open-top, cab-type vehicle used to transport personnel or light general cargo. It is a common vehicle for most units and can be easily adapted for transporting five litters. To adapt this

vehicle for transporting casualties, the procedures listed below should be followed:

- a. Fold the fabric cover and metal bows forward and together as an assembly. Secure them in place and lower seats and tailgate.
- b. Place three litters side-by-side across the side boards. Secure the litters in place.
- c. Place two litters lengthwise, head first, in the bed of the truck. Secure these litters in place.
- d. Close the tailgate.
- e. Litters are unloaded in the reverse order of loading.

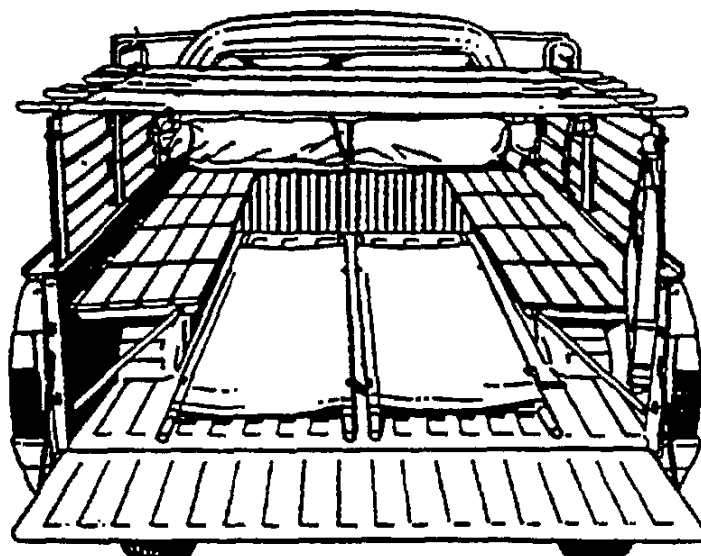


Figure G-33. M880/890 and M1008 With Five Litters

G-25. Truck, Cargo/Troop carrier, 1 1/4 Ton, 4x4, M998.

The 1 1/4-ton cargo truck, four-man configuration (Figure G-34) can be easily adapted for transporting three litters. To convert this vehicle for carrying litters, the procedures listed below should be followed:

- a. Remove the cargo cover and metal bows. Secure them in place. Lower the tailgate.

b. Place two litters side-by-side across the back of the truck with the litter handles resting on the sides of the truck.

NOTE

When the route of evacuation is along narrow roads or trails, care must be taken to prevent the litter handles from catching on trees and bushes.

c. Secure the litters to the vehicle.

d. Place one litter lengthwise, head first, in the bed of the truck. Secure it in place.

e. Leave tailgate open. It is supported by the two tailgate chain hooks.

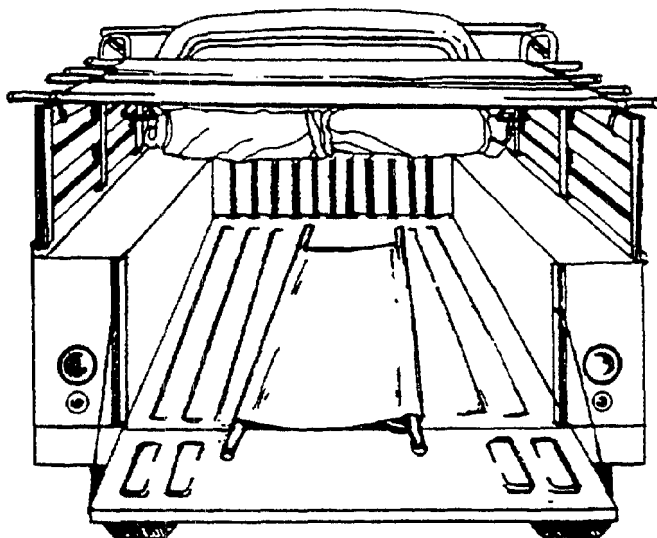


Figure G-34. M998 With Three Litters

G-26. Truck, Cargo/Troop carrier, 1 1/4 Ton, 4x4, M998.

The 1 1/4-ton cargo truck, two-man configuration (Figure G-35), can be easily adapted for transporting five litters. To convert this vehicle to carry patients, the procedures listed below should be followed:

a. Fold the fabric cover and metal bows forward and together as an assembly. secure them in place. Lower the tailgate.

b. Place three litters side-by-side across the side boards. Secure them in place.

c. Place two litters lengthwise, head first, in the bed of the truck. Secure them in place.

d. Leave tailgate open. It is supported by the two tailgate chain hooks.

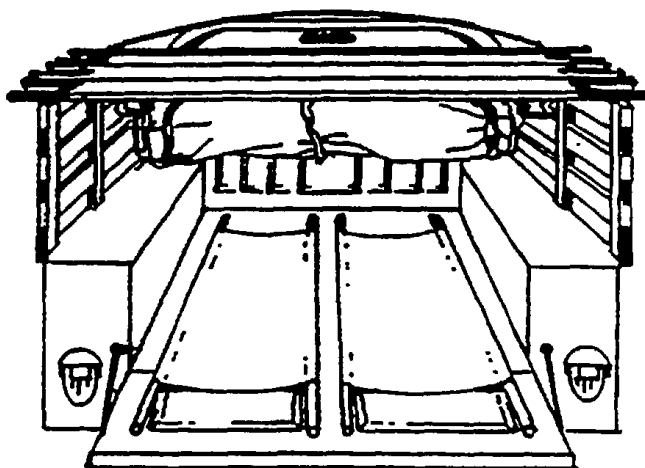


Figure G-35. M998 With Five Litters

G-27. Truck, Cargo, 5 Ton, 6x6, Wide Bed, and Truck, Cargo, 2 1/2 Ton, 6x6, Wide Bed.

These trucks (Figure G-36) are normally used to transport general cargo as well as personnel. They have canvas-covered cabs and removable tarpaulin braces and sideboards. Both vehicles have a maximum capacity of 12 litters. These vehicles can be used for patient transportation by:

a. Removing the canvas cover (The cover can be rolled toward the front of the truck and secured).

b. Lowering the seats.

c. Placing three litters crosswise on the seats as far forward as possible and three litters lengthwise in the bed of the truck as far forward as possible.

d. Securing the litters individually to the seats.

e. Placing three additional litters crosswise on the seats and three additional litters lengthwise in the bed of the truck.

f. Securing these litters individually to the seats.

g. Raising and securing the tailgate as high as possible to help secure the litters in place.

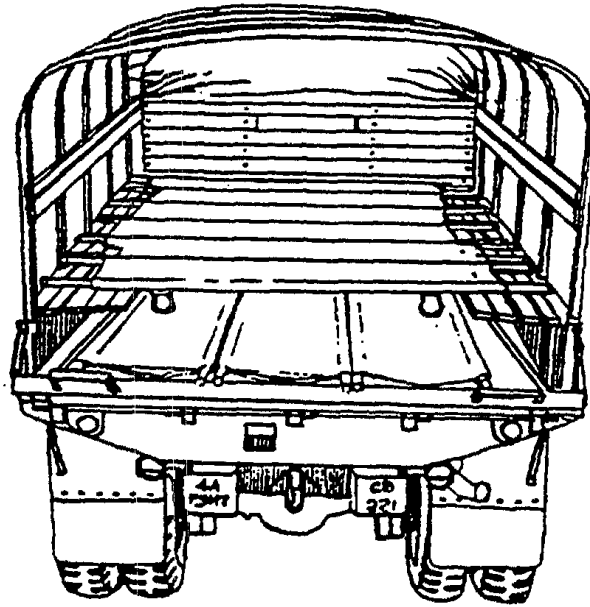


Figure G-36. Truck, Cargo, 2 1/2 Ton 6x6, With 12 Litters

G-28. Heavy Expanded Mobility Tactical Truck (HEMTT), 8x8, Cargo, M977.

The HEMTT is normally used to transport heavy cargo. It may or may not have the cargo cover kit consisting of the cover, stakes, and bows. The HEMTT has collapsible sides and can be used to transport the wounded in a mass patient situation. It can be adapted to carry a maximum of nine litter patients on one lift. Instructions for the loading of this vehicle are to:

a. Start at the rear of the vehicle. Roll the cargo cover (if it is on the vehicle) toward the front of the vehicle. Remove the corner lockpins and raise the panel latches to lower the rear section of the cargo body. Remove the first two bows and drop one side of the cargo bed. This will be the side used for patient loading.

WARNING

Side panels can slide off of the hinge pins when the vehicle is parked on a grade. This can cause further injury to the casualty.

b. Place one litter team in the back of the cargo bed to arrange and secure the litters. The second litter team will carry and place the litters into the cargo bed.

c. Load the litters from front to back, head to toe, and the less serious to the most serious based on patient triage. The litters will be placed horizontally on the cargo bed (Figure G-37).

d. Raise and secure the side panel to ensure litter stability and patient safety. Replace the bows, and re-roll the canvas cover, if necessary, to provide protection from the elements.

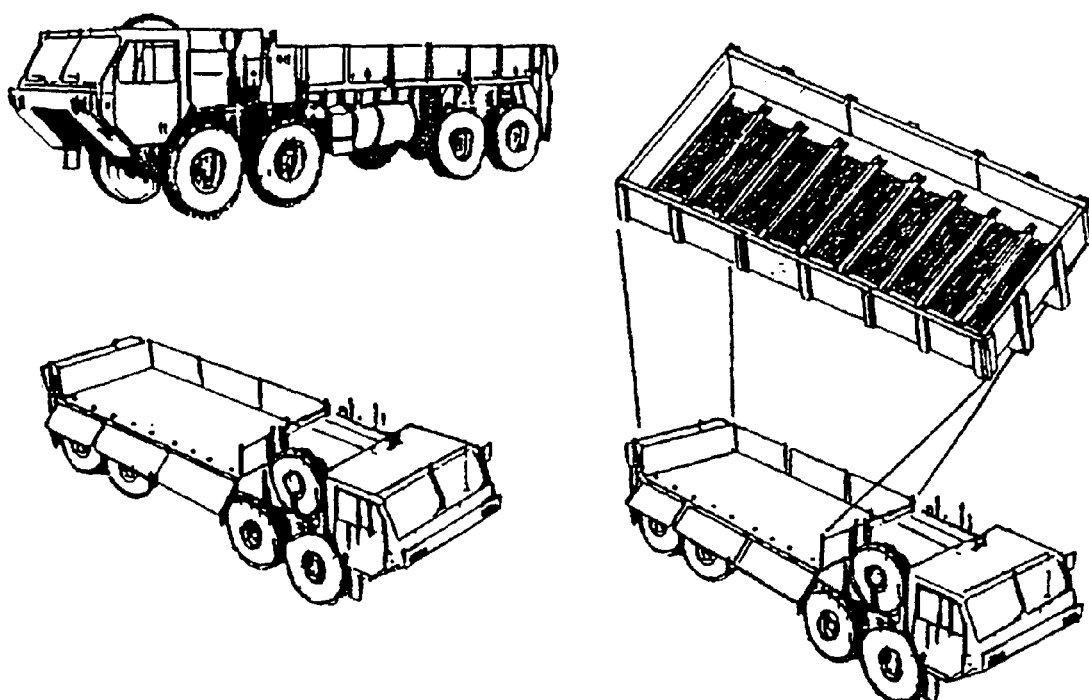


Figure G-37. HEMTT, 8x8, Cargo, M977

G-29. Semi-Trailer, Cargo, 22 1/2 Ton, M871.

The 22 1/2-ton cargo trailer (M871) (Figure G-38) is attached to a prime mover such as a M800- or M900- series tractor for the transport of general cargo. (There are no major differences between the M871 and the M871A1 semi-trailers.) It has 1 1/3-foot high wooden sides with a canvas trailer cover. This trailer can be used to transport wounded in a mass casualty situation. It can be adapted to carry 16 litters in a single lift. Instructions for the loading of this trailer are to:

a. Remove the tie downs which secure the canvas cover and roll it toward the front of the trailer.

- b. Remove the rear panels exposing the trailer bed.
- c. Use one litter team in the cargo bed to arrange and secure the litters in the cargo area, while another litter team lifts the casualties to the bed of the trailer.
- d. Load litters from right to left, front to back, based on patient triage. The more seriously injured are loaded last so that they are unloaded first.
- e. Place litters lengthwise, with casualties in a head-to-toe configuration.
- f. Replace the rear doors to ensure the security of the litters.
- g. Re-roll the cargo cover 3/4 of the way down, then secure the cover to protect the casualties.

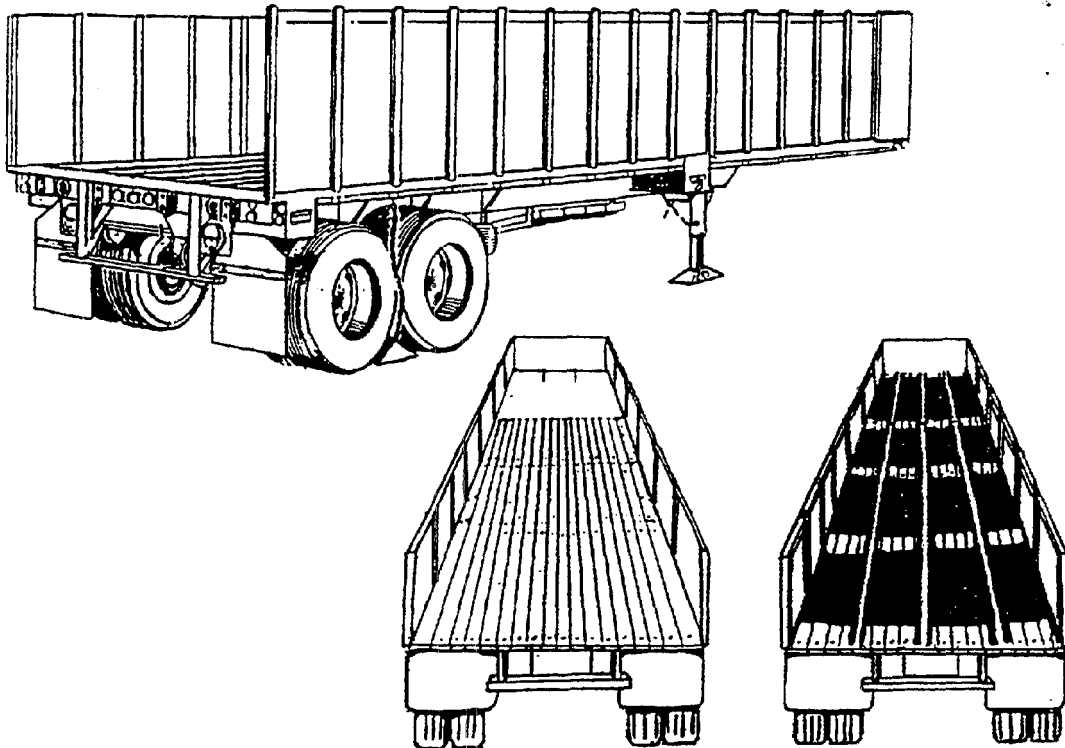


Figure G-38. M871 Loaded With Litter

Section IV

EVACUATION BY MEDICAL AIR AMBULANCES

G-30. General.

Aeromedical evacuation is accomplished by both helicopter and fixed-wing aircraft. Dedicated aeromedical evacuation assets permit en route patient care. This care minimizes further injury to the patient and decreases mortality.

G-31. Advantages of Aeromedical Evacuation.

Evacuation by aircraft is considered advantageous for a variety of reasons.

a. The speed with which the patient can be evacuated by air to an MTF ensures the timeliness of treatment, thus contributing to:

- (1) Saving lives.
- (2) Reducing permanent disability.
- (3) Increasing the number of patients returned to duty.

b. The range and speed of aircraft make it possible to evacuate patients by air over relatively long distances in short periods of time. This requires the less frequent displacement of MTFs.

c. Helicopters can move patients quickly over terrain where evacuation by other means would be difficult and perhaps impossible to accomplish. The minimum landing area required for helicopters and other vertical/short takeoff and landing (V/STOL) aircraft permits patients to be picked up well forward and delivered to the supporting MTFs.

d. Because of the speed, range, flexibility, and versatility of aeromedical evacuation, patients can be moved directly to the MTF best equipped to deal with their condition.

e. The selectivity in the use of MTFs made possible by aeromedical evacuation procedures permits economy in the use of these facilities. Fewer specialty treatment teams are required because of the capability to rapidly evacuate patients to hospitals with the required specialties. Hospitals are required to move less often, thereby reducing periods of non-effectiveness during movement and reestablishment.

G-32. Responsibilities for Loading.

The commander who originates the patient evacuation request is responsible for delivering the patient to the landing site and for loading him aboard the aircraft. The actual loading is supervised by the aeromedical evacuation personnel. In airhead operations, patients are normally transported by vehicle or litter bearers to designated points within the perimeter of the airhead where evacuation aircraft may be available.

G-33. Air Ambulances.

Helicopters are rotary-wing aircraft capable of horizontal, vertical, lateral, and hovering flight. Their ability to circumvent terrain and obstacles, and the minimum requirements for takeoff and landing enable them to operate from areas inaccessible to fixed-wing aircraft or surface vehicles. The helicopters capability of flight at relatively slow speeds permit operations during periods of reduced ceiling and visibility. Helicopters are organic to the air ambulance units and aviation units of the division and corps. Military helicopters are designated by a combination of letters and numbers which are used to identify the basic mission and type: observation helicopter (OH), utility helicopter (UH), and cargo/transport helicopter, (CH). The last two classes of helicopters can be used for the air evacuation of litter patients.

a. The UH-60A Blackhawk (Figure G-39). This helicopter is used as the primary dedicated air ambulance. The normal configuration for aeromedical evacuation provides for four litter patients and one ambulatory patient the maximum configuration provides for six litter patients and one ambulatory patient, or seven ambulatory patients.

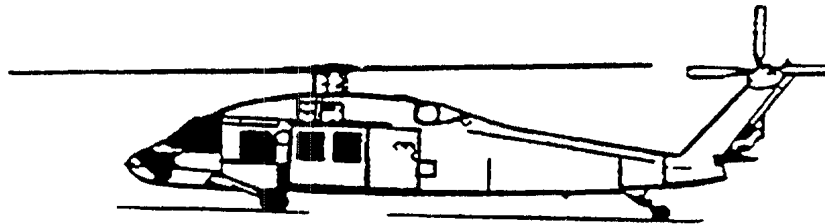


Figure G-39. UH-60A Blackhawk

b. The UH-1H/V Iroquois (Figure G-40). This aircraft also is used as a dedicated air ambulance. The normal evacuation configuration provides for three litter and four ambulatory patients. The maximum patient configuration provides for six litter patients or nine ambulatory patients.

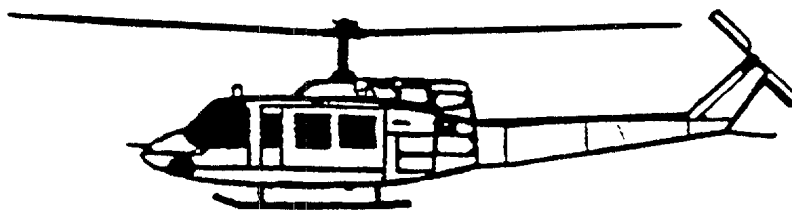


Figure G-40. UH-1H/V Iroquois

G-34. Helicopter Landing Sites.

a. Responsibility. The unit requesting aeromedical evacuation support is responsible for selecting and properly marking the helicopter LZs.

b. Criteria for Landing Sites.

(1) The helicopter LZ and the approach zones to the area should be free of obstructions. Sufficient space must be provided for the hovering and maneuvering of the helicopter during landing and takeoff. The approach zones should permit the helicopter to land and take off into the prevailing wind whenever possible. It is desirable that landing sites afford helicopter pilots the opportunity to make shallow approaches.

(2) Define measurements for LZs cannot be prescribed since they vary with temperature, altitude, wind, terrain, loading conditions, and individual helicopter characteristics. The minimum requirement for light helicopters is a cleared area of 30 meters in diameter with an approach and departure zone clear of obstructions.

c. Removing or Marking Obstructions. Any object (paper, cartons, ponchos, blankets, tentage, or parachutes) likely to be blown about by the wind from the rotor should be removed from the landing area. Obstacles, such as cables, wires, or antennas at or near LZs, which cannot be removed and may not be readily seen by a pilot, must be clearly marked. Red lights are normally used at night to mark all obstacles that cannot be easily eliminated within a LZ. In most combat situations, it is impractical for security reasons to mark the tops of obstacles at the approach and departure end of a LZ. If obstacles or other hazards cannot be marked, pilots should be advised of existing conditions by radio.

d. Identifying the Landing Site (Figures G-41 through G-45).

(1) When the tactical situation permits, a landing site should be marked with the letter "H" or "Y", using

identification panels or other appropriate marking material. Special care must be taken to secure panels to the ground to prevent them from being blown about by the rotor wash. Firmly driven stakes will secure the panels tautly; rocks piled on the corners are not adequate.

(2) If the tactical situation permits, the wind direction may be indicated by a:

(a) Small wind sock or rag tied to the end of a stick in the of the LZ.

(b) Man standing at the upwind edge of the site with his back to the wind and his arm extended forward.

(c) Smoke grenades which emit colored smoke as soon as the helicopter is sighted. Smoke color should be identified by the aircrew and confirmed by ground personnel.

(3) In night operations, the following factors should be considered:

(a) One of the many ways to mark a landing site is to place a light, such as a chemical light, at each of the four corners of the usable LZ.

These lights should be colored to distinguish them from other lights which may appear in the vicinity. A particular color can also serve as one element in identifying the LZ. Flare pots or other types of open lights should only be used as a last resort. They usually are blown out by the rotor downwash. Further, they often create a hazardous glare or reflection on the aircraft's windshield. The site can be further identified using a coded signal flash to the pilot from a ground operator. This signal can be given with the directed beam of a signal lamp, flashlight, vehicle lights, or other means. When using open flames, ground personnel should advise the pilot before he lands. Burning material must be secured in such a way that it will not blow over and start a fire in the LZ. Precautions should be taken to ensure that open flames are not placed in a position where the pilot must hover over or be within 3 meters of them. The coded signal is continuously flashed to the pilot until recognition is assured. After recognition, the signal operator, from his position on the upwind side of the LZ, directs the beam of light downwind along the ground to bisect the landing area. The pilot makes his approach for landing in the line with the beam of light and toward its source, landing at the center of the marked area. All lights are displayed for only a minimum time before arrival of the helicopter. The lights are turned off immediately after the aircraft lands.

(b) When standard lighting methods are not possible, pocket-sized white (for day) or blue (for night) strobe

lights are excellent means to aid the pilot in identifying the LZ.

(c) During takeoff, only those lights requested by the pilot are displayed; they are turned off immediately after the aircraft's departure.

(4) When the helicopter approaches the LZ, the ground contact team can ask the pilot to turn on his rotating beacon briefly. This enables the ground personnel to identify the aircraft and confirm its position in relation to the, LZ (north, south, east, or west). The rotating beacon can be turned off as soon as the ground contact team has located and identified the aircraft. The ground contact team helps the pilot by informing him of his location in relation to the LZ, observing the aircraft's silhouette, and guiding the aircraft toward the LZ. While the aircraft is maneuvering toward the LZ, two-way radio contact is maintained and the type of lighting or signal being displayed is described by the pilot and verified by ground personnel via radio. The signal should be continued until the aircraft touches down in the LZ.

(5) The use of FM homing procedures can prove to be a valuable asset, especially to troops in the field under adverse conditions. Through the use of FM homing, the pilot can more accurately locate the ground personnel. The success of a homing operation depends upon the actions of the ground personnel. First, ground personnel must be operating an FM radio which is capable of transmitting within the frequency range of 30.0 to 69.95 megahertz; then they must be able to gain maximum performance from the radio (refer to appropriate technical manual for procedure). The range of FM radio communications is limited to line of sight; therefore, personnel should remain as clear as possible of obstructions and obstacles which could interfere with or totally block the radio signals. Ground personnel must have knowledge of the FM homing procedures. For example, when the pilot asks the radio operator to "key the microphone," he is simply asking that the transmit button be depressed for a period of 10 to 15 seconds. This gives the pilot an opportunity to determine the direction to the person using the radio.

NOTE

When using FM homing electronic countermeasures, the possible site detection of LZs by means of electronic triangulation presents a serious threat and must be considered.

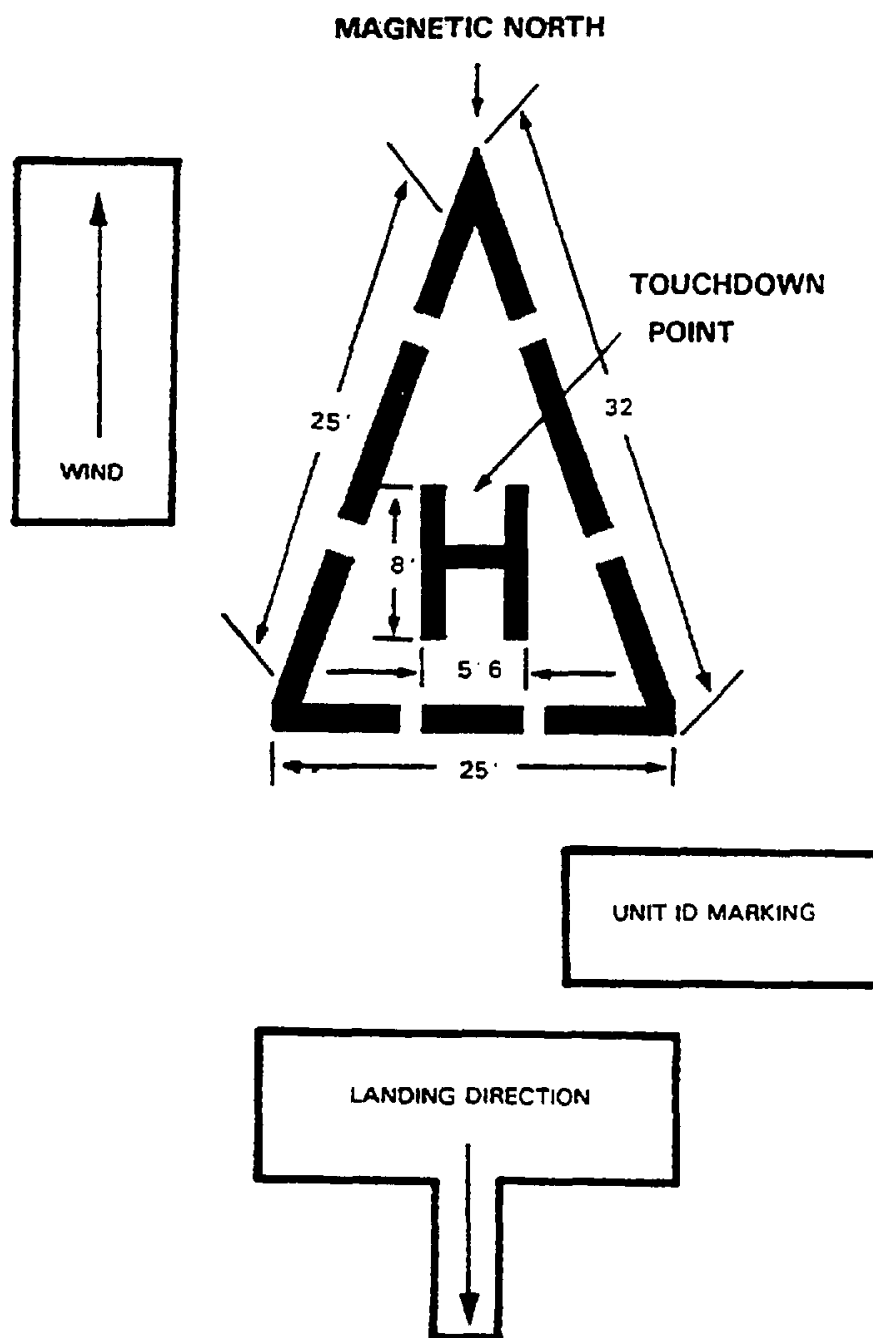


Figure G-41. Semi-Fixed Base Operations (Day)

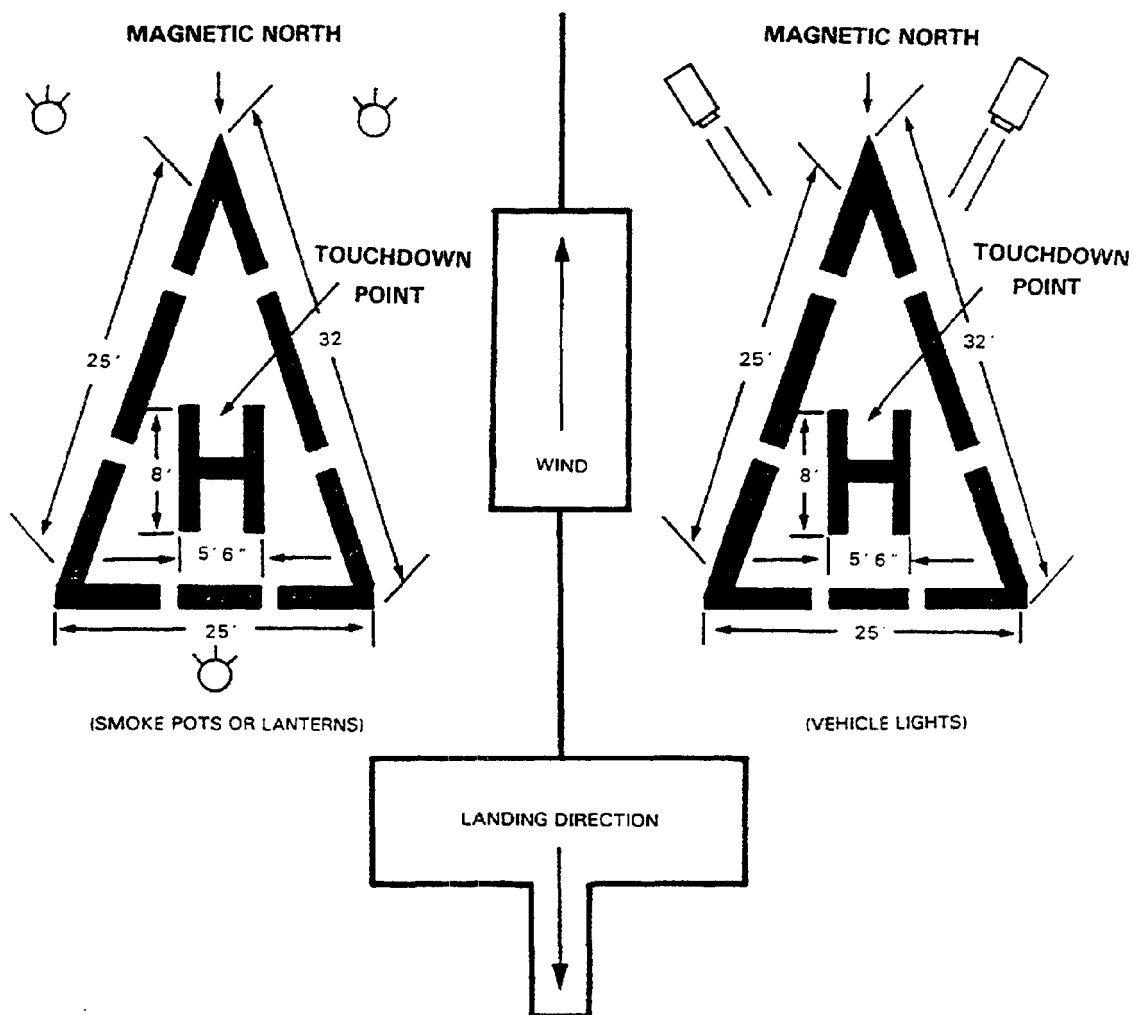


Figure G-42. Semi-Fixed Base Operations (Night)

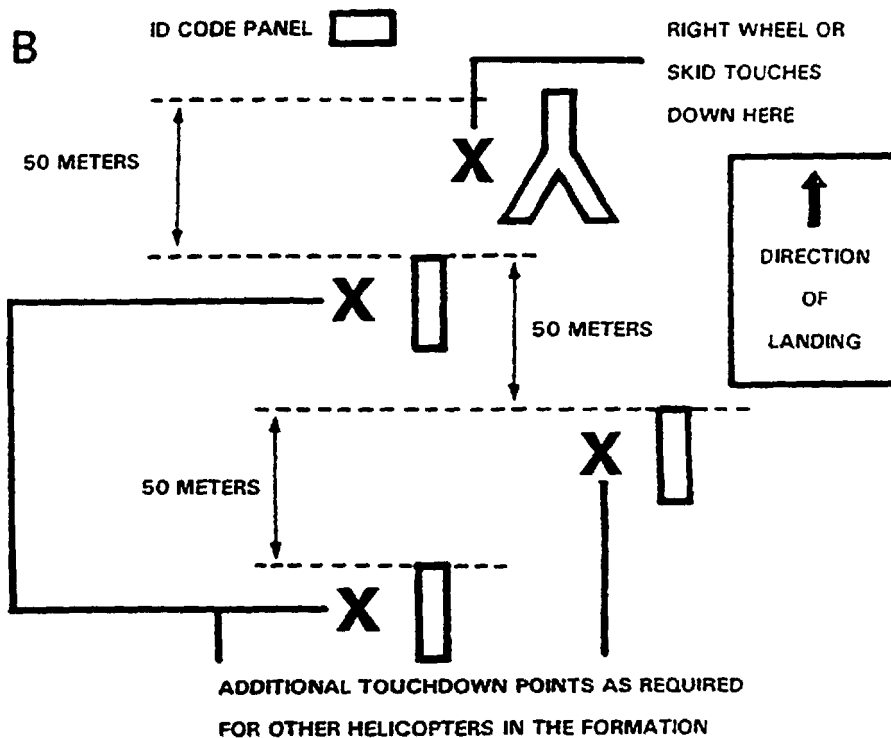
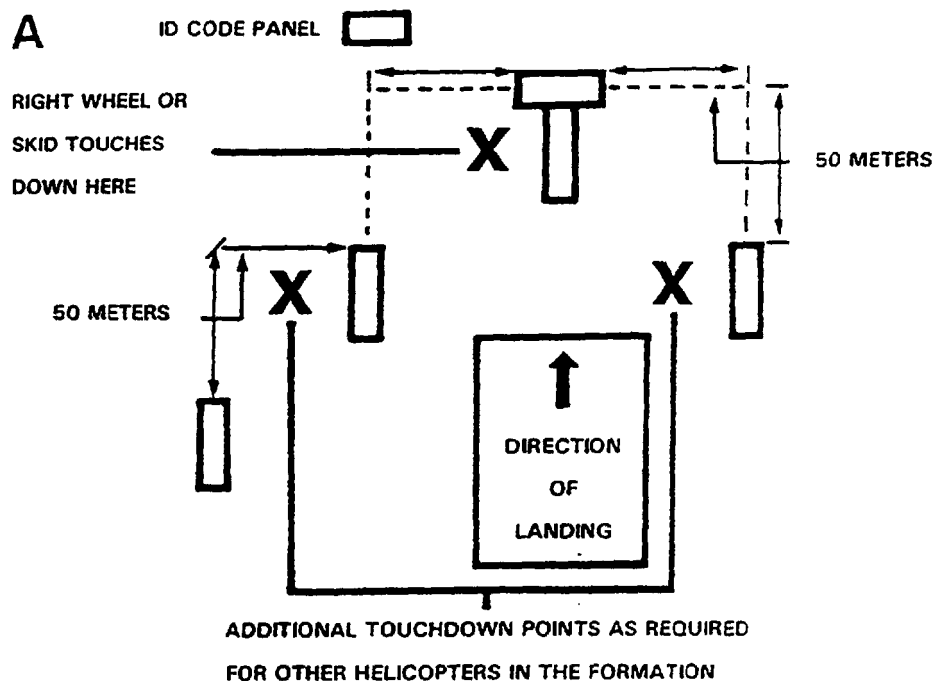


Figure G-43. Field Expedient Landing Zone (Day)

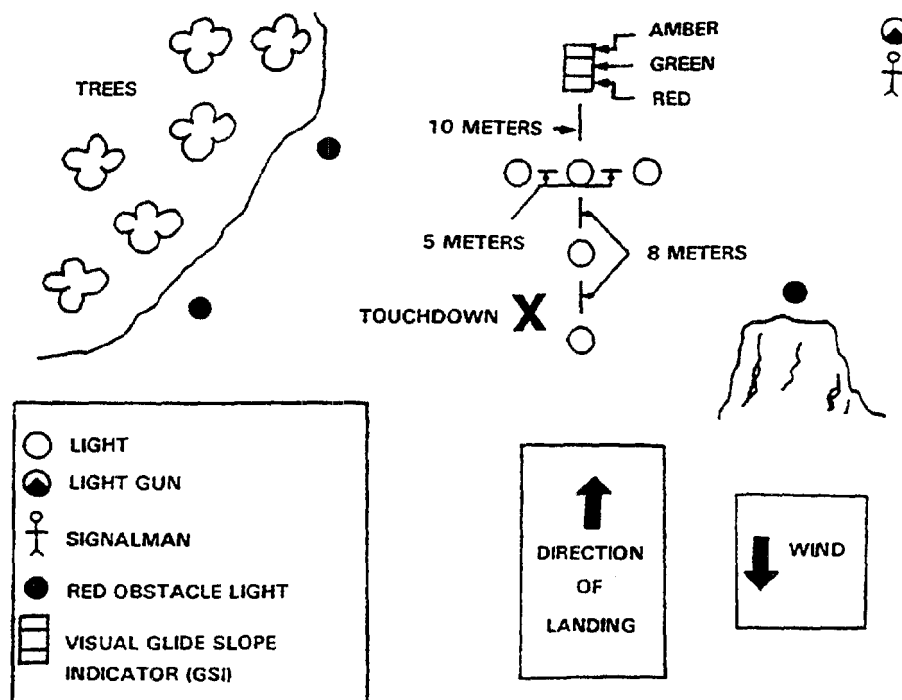


Figure G-44. Field Expedient (T) LZ (Night)

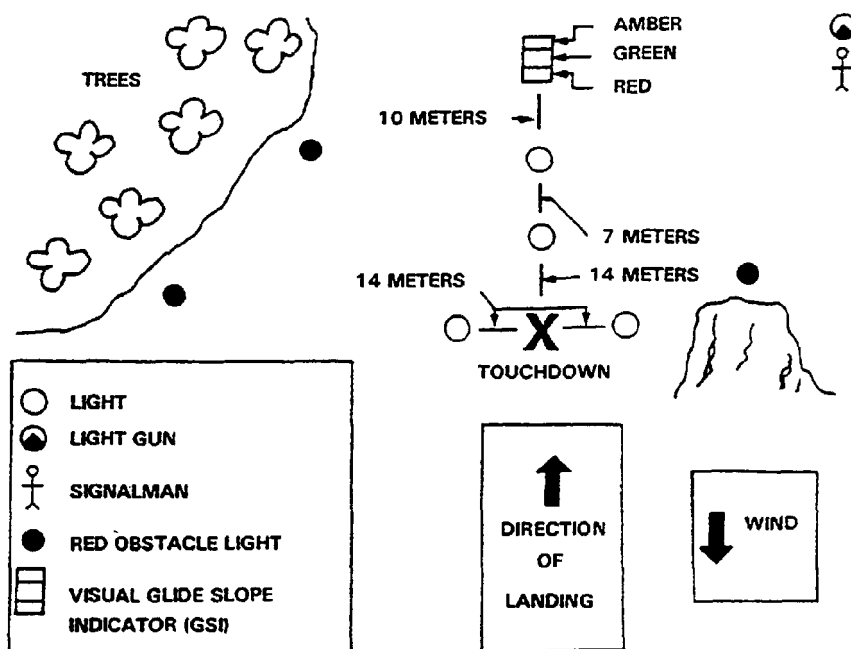


Figure G-45. Field Expedient (Y) LZ (Night)

6. Loading Patients Aboard Rotary-Wing Aircraft.

a. Responsibility for Loading and securing. The pilot is responsible for ensuring that the litter squad follows the prescribed methods for loading and securing litters and related equipment. The final decision regarding how many patients may be safely loaded rests with the pilot.

b. Safety Measures. When loading and unloading a rotary-wing aircraft, certain precautionary measures must be observed. Litter bearers must present as low a silhouette as possible and must keep clear of the rotors at all times. The helicopter must not be approached until a crew member signals to do so. The litter bearers should approach the aircraft at a 45 degree angle from the front of the helicopter. If the helicopter is on a slope and conditions permit, loading personnel should approach the aircraft from the downhill side. Directions given by the crew must be followed, and litters must be carried parallel to the ground. Smoking is not permitted within 50 feet of the aircraft.

7. Loading Patients Aboard the UR-60A Blackhawk Helicopter.

a. Interior of the UH-60A Blackhawk Helicopter. This helicopter, as with the UH-1H/V, has a number of possible seating or cargo configurations. A major difference in preparing the UH-60A to carry litters is that a medical evacuation kit must be installed. This kit consists of a seat/converter assembly unit and a litter support unit. The seat/converter assembly provides for three rearfacing seats which allows the medical attendant and crew chief to monitor patients. The litter support unit consists of a center pedestal which can be rotated 90 degrees about the vertical axis for the loading and unloading of patients. The litter support unit has a capacity of four to six litter patients. The patients can be loaded from either side of the aircraft. Only the upper litter supports in the four-litter configuration can be tilted for loading and unloading patients.

If litter patients are not being evacuated, a maximum of six ambulatory patients can be seated on the litter support unit (three on each side). A seventh ambulatory patient can be seated on a troop seat.

NOTE

When the six-litter modification kit is installed, the center pedestal can no longer be rotated.

NOTE

Only three litters can be loaded when using the internal rescue hoist.

When the medical evacuation kit is installed, a number of cabin configurations are possible. (See Tables G-3 and G-4.)

Table G-3. Patient Configurations, UH-60A Medical Evacuation Kit

Four-Litter (Combat) Configuration	Six-Litter (High Capacity) Configuration
4 litter patients 1 ambulatory patient	6 litter patients 1 ambulatory patient
2 litter patients 4 ambulatory patients	3 litter patients 4 ambulatory patients
No litter patients 7 ambulatory patients	No litter patients 7 ambulatory patients

NOTE

With each configuration, there is sufficient room to carry a crew chief and a medical aidman.

Table G-4. Patient Configurations, UH-60A Medical Evacuation Kit with Internal Rescue Hoist Installed

Four-Litter (Combat) Configuration	Six-Litter (High Capacity) Configuration
3 litter patients 1 ambulatory patient	4 litter patients 1 ambulatory patient
No litter patients 4 ambulatory patients	No litter patients 4 ambulatory patients

NOTE

With each configuration, there is sufficient room to carry a crew chief and a medical aidman.

b. Guides for Loading Patients.

(1) Litter patients should be positioned in the helicopter according to the nature of their injuries or condition. Personnel aboard the aircraft supervise the loading and positioning of the patients. Normally, the helicopter has a crew of four. The crew consists of a pilot in command, co-pilot, crew chief, and medical aidman.

(2) The most seriously injured patients are loaded last on the bottom pans of the litter support unit. A patient's condition, however, may require in-flight emergency medical care (such as cardiopulmonary resuscitation). To facilitate access to the patient, he should be loaded onto either of the top pans.

(3) The structuring of the litter support unit allows patients to receive IV fluids and oxygen in flight. Patients receiving IV fluids can be placed on any of the litter pans, depending on their injuries or condition.

(4) Patients in traction splints should be loaded last and on a bottom pan.

(5) The UH-60A has the capability to be loaded on both sides simultaneously. Patients should be loaded so that upon rotating the litter support, the patient's head will be forward in the cabin. To accomplish this, patients loaded on the left side of the aircraft should be loaded head first and patients loaded on the right side of the aircraft should be loaded feet first (left and right sides are determined from the position of the PC's seat, looking forward.) When the six-litter configuration is used, the fifth and sixth litter patients are loaded with the carousel in the fly position. The patient's heads should face toward the front of the aircraft.

c. Installing Litter Pan Supports. Each litter support is attached to the center pedestal by two end pivot shafts and by two T-shaped fittings. These fittings and shafts allow for the removal, interchange, or repositioning of the supports. There are five pivot shaft support holes at both ends on the right and left side of the center console. Behind the holes are support rollers for the pivot shafts. From top to bottom, the top hole is provided for the upper litter in the six litter configuration. The second hole is for the upper litter support, of a four litter configuration. These end holes line up with a central pivot hole, which accommodates a central pivot shaft on the litter support. Only this litter position allows midposition pivoting for loading or unloading. The third hole is for the center litter of the six-litter configuration. The fourth hole is used when installing the litter support as a seat for evacuating ambulatory patients. The fifth hole is used for the lower litter support in the four-litter configuration. The third, fourth, and fifth positions do not provide a tilt function.

(1) Lower litter support installation. Before installing, each center pivot shaft must be retracted and unlocked. The center pivot shaft handle must be secured in the handle retainer. End pivot handles must be in the tilt position.

(a) Engage T-bars on litter support with split retention fittings at the bottom of the pedestal.

(b) Line up the end pivot shafts with holes. Disengage the pivot shaft lever locks and move the end pivot shaft lever toward the pedestal. The pivot shaft is, then, fully inserted into the pivot shaft holes on the pedestal and the handle lock is engaged.

(c) Repeat step (b) for the other end of litter support.

(2) Upper litter support installation. Before installing, each center pivot pin must be unlocked and retracted. The handle is then disengaged from its retainer. The end pivot handles must be in the tilt position.

(a) Tilt the outer edge of litter support slightly down and engage the T-bars into split retention fittings at the second support hold from the top of pedestal.

(b) Raise the outer edge of the litter support until the support is level.

(c) Insert the end pivot shaft into the pedestal by pulling on the pivot shaft lever lock and moving the lever toward pedestal until end pivot shaft engages partway in end pivot support hole.

(d) Turn the center pivot shaft lock handle counterclockwise until it is horizontal.

(e) Push the center pivot shaft toward the pedestal until the shaft is fully inserted into the center pivot shaft hole. The opposite end of the litter support should be raised or lowered to align the center shaft on the support with the center hole on pedestal.

(f) Turn the center pivot lock lever clockwise to the horizontal positions.

(g) Repeat step (c) above for the other end of litter support. Now slide both end pivot shafts in fully by moving the pivot lever lock handle to engaged position.

(3) Upper litter support relocation for six-liter configuration.

(a) Remove the litter support from the second support hole from the top of the pedestal. The removal of the litter support is the reverse of its installation. Before relocation, each center pivot pin must be locked and the handles must be secured in the handle retainer.

(b) Line up the end pivot shafts with the top support holes. Then fully insert and engage the handle lock.

(c) Repeat steps (a) and (b) above for other end of litter support.

(4) Middle litter support installation for six-litter configuration.

(a) Remove the litter support from the fifth (bottom) support hole. The removal of the litter support is the reverse of its installation.

(b) Align the end pivot shafts with third support hole from top of pedestal to relocate it. Then fully insert and engage handle lock.

(c) Repeat steps (a) and (b) above for their end of litter support.

(5) Bottom litter support installation for six-litter configuration. To complete the six-litter configuration, the modification kit is required. The kit consists of a tube assembly and a restraint assembly for each side.

(a) Insert the restraint assembly using the plate quick disconnect fittings into the proper quick attachment fittings on the cargo floor. Pull up on the restraint assembly to check for secure installation.

(b) Attach tube assembly longitudinally to the proper tie down restraint rings on the cargo floor. Ensure that the restraint rings are properly secured to the bracket tube support with the attached pin (Figure G-46).

(c) Repeat steps (a) and (b) above for the other end of the litter support.

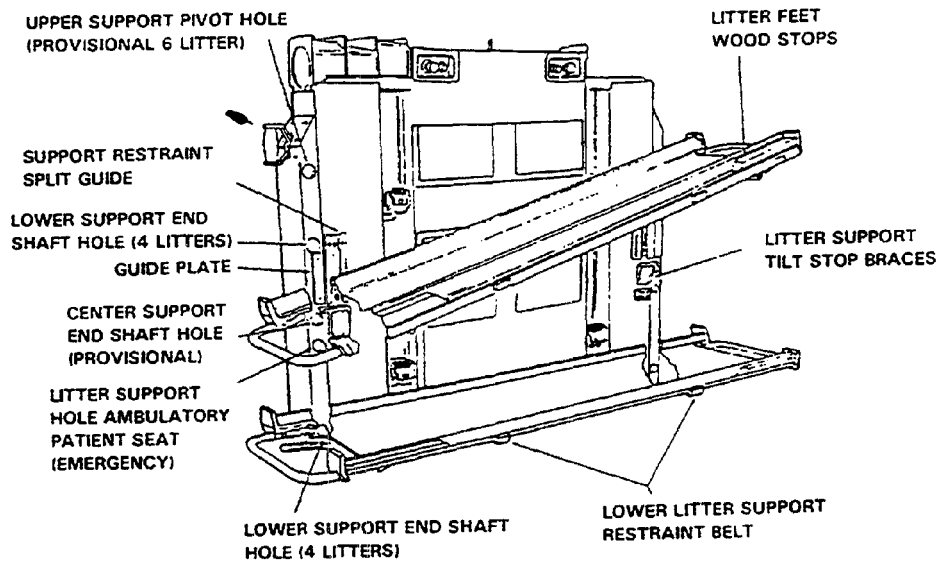


Figure G-46. Litter Pan in the Load and Unload (Tilt) Position (Same at Other Side of Pedestal)

(6) Litter support installation for ambulatory patient seating.

(a) Prepare supports as in c(1) above.

(b) Engage the T-bar on the litter pan with the split retention brackets below the support tilt stop brackets.

(c) Position the litter support at the second from the bottom litter support end pivot hole on pedestal.

(d) Line up the end pivot shafts with the holes. Disengage pivot shaft lever lock and move pivot shaft lever toward pedestal. Fully insert the 6 pivot shaft into pivot shaft hole on pedestal and engage handle lock.

(e) Repeat step (c) for the other end of litter support.

(7) Storage of litter pans.

(a) Lower stowage brackets to the horizontal position and insert the retaining pin through stowage bracket into pedestal.

WARNING

Improper positioning of the stowage bracket retaining pin reduces the holding capability of the stowage bracket and may cause it to shear the pivot bolt during a crash sequence.

(b) Place the litter pan in the stowed position against the center pedestal.

(c) Secure the litter pan to the center pedestal by routing the opposite web strap around the upper portion of the litter pan handle. Secure the metal clasp to the metal ring.

NOTE

The use of opposite strap reduces excess movement of litter pan.

(d) Use opposite web strap to secure the upper side of the litter pan handle as described in step (c) above, while the same side web strap is used to secure the bottom side of the stored litter pan handle.

(e) Remove the stowed litter pans by reversing steps (a)-(d) above.

d. Loading of Upper Litters. For ease of loading, the upper litter pans may be tilted. Upper litter pans are supported by a center pivot shaft and two end pivot shafts, one at each end of the litter pan. To tilt the upper support for the loading and unloading of litter patients, the center shaft remains locked to the pedestal and the end shafts are disengaged for support pivoting.

NOTE

This system was designed to pivot about the center shaft allowing either end to be tilted downward. Although the supports may be pivoted at either end, more effort is required when a loaded litter is installed.

e. Loading and Securing Patients.

(1) In loading four litter patients with a four-man litter squad, the litters are loaded from, the top to bottom. The sequence for loading litters from one side of the aircraft with the carousel turned is upper right, upper left, lower right, and then lower left. To load litters from both sides of the aircraft simultaneously, the sequence is upper then lower (Figure G-47).

(a) The litter support unit is rotated 90 degrees clockwise to receive the litter patients. The flight crew lowers the top pan to accept the litter and stands by to assist. This is accomplished as the litter squad approaches the aircraft.

(b) The litter squad moves into the semioverhead carry, lifting the litter just high enough for the litter stirrups of one end to slide on to the litter pan. The litter squad slides the litter forward. The flight crew member guides and assists the litter squad, until the litter stirrups of both ends are secured on the pan. The litter squad departs as the flight crew member raises the pan back to its upright position and secures it. The flight crew member fastens the litter straps attached to the litter support assembly.

(c) After the first litter is loaded, the squad leaves the aircraft as a team to obtain another litter patient. The second, third, and fourth litters are loaded in the same manner, except that the bottom pans are not tilted to receive patients.

(d) After having loaded four litter patients, the litter support unit is rotated 90 degrees counterclockwise and locked in the in-flight position. The cargo doors must be closed for flight.



Figure G-47. Loading Litter into UH-60A

(2) The loading of six litter patients requires the repositioning of the litter support prior to loading. The loading procedure remains the same as the four-litter configuration except for the following:

(a) The top litter support no longer tilts. This necessitates overhead loading and may require additional assistance.

(b) After four litters are loaded, the pedestal must be rotated back to the locked position. The restraint and tube assembly modification kit is then installed. The last two litters are side loaded between the restraints, with the patients' heads towards the front of the aircraft. They are secured.

(3) When the aircraft is to receive a mixed load of litter and ambulatory patients, one top pan of the litter support is removed and repositioned just above the bottom pan on the same side. The aircraft can now accommodate two or three litter and four ambulatory patients (Figure G-48).

(a) The litter support unit is rotated clockwise to receive the litter patients, except for the third litter in the six-litter configuration. The litters are loaded as described in paragraph e(1) above. Upon loading and securing the litter patients, the litter support unit is rotated counterclockwise to the in-flight position. The third litter is then loaded when the six-litter configuration is used.

(b) Ambulatory patients are escorted to the aircraft by ground personnel. They are assisted into their seats and secured with the seat belts attached to the litter support unit.

(c) The cargo doors are now closed for flight.

WARNING

To prevent further injury to patients, all end support pins of the installed litter pans must be in the locked position for flight.

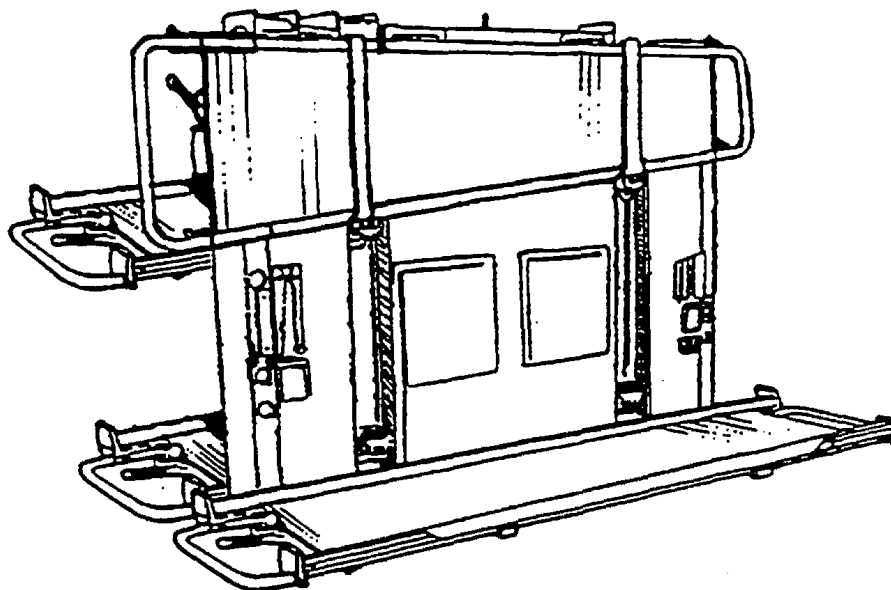


Figure G-48. Litter Support

f. Unloading Patients. The aircraft is unloaded in the reverse order of the loading procedure. The pans are normally unloaded bottom pan first, then top to ensure that the most seriously injured patients are unloaded first.

8. Loading Patients Aboard the UH-1H/V Iroquois Helicopter.

a. Interior of the UH-1H/V Iroquois Helicopter. This helicopter has several litter and seating configurations. A change, to meet operational requirements, can be made from one configuration to another within a few minutes. Facilities for carrying a tier of three litters loaded lengthwise in the aircraft are located on each side of the helicopter cargo compartment (Figure G-49). This gives the helicopter a maximum litter capacity of six or a total of nine ambulatory patients. The configuration is normally used in rear areas to move large numbers of stable patients. The normal configuration for the aircraft is three litter patients loaded crosswise and four ambulatory patients. The maximum load the helicopter can lift must be considered. This load capacity varies with the altitude and temperature. The pilot advises the personnel on the ground of his load capacity.

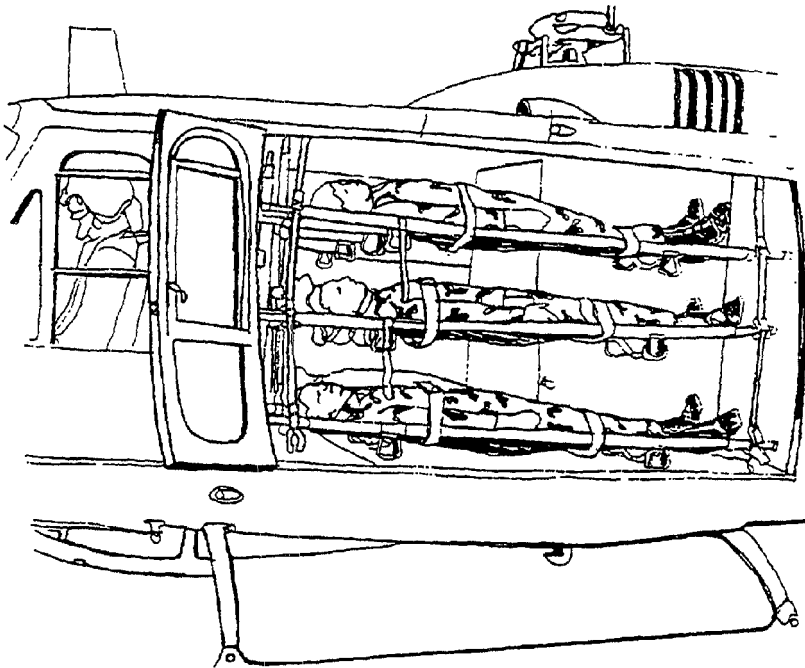


Figure G-49. Interior View of UH-1H/V Iroquois Helicopter, Six-Litter Configuration

b. Guides for Loading Patients. Patients are normally loaded from the top tier down to the bottom tier, with the most seriously injured loaded last.

(1) Litter patients should be positioned in the helicopter according to the nature of their injuries or condition. Personnel aboard the helicopter supervise the loading of the aircraft.

(2) The most seriously injured patients are placed in the bottom litter tiers to permit in-flight care.

(3) Litter patients receiving IV fluids should not be positioned on the top row of litter tiers but should be placed as low as possible in the litter rack.

(4) Patients in Hare traction splints with splint supports and footrests must be loaded last and placed directly on the floor of the helicopter.

c. Loading and Securing Patients.

(1) In loading six litter patients with a four-man litter squad, the litters are loaded from both sides of the aircraft and from top to bottom. Figures G-50 and G-51 illustrate procedures for loading the right side. Figure G-52 illustrates procedures for loading the left side.

(2) When the helicopter is equipped for mixed loading (Figures G-53 thru G-55), three litters are loaded crosswise and four ambulatory patients are loaded in the side seats.

(a) When loading from the left, the litter squad moves to the side of the helicopter with the litter perpendicular to the cargo compartment; then the squad moves into a litter post carry. Bearers numbers 1 and 3 give their litter handles to the crew members who place the handles in the litter support brackets on the far side of the aircraft. Bearers numbers 2 and 4 secure the foot of the litter.

(b) After the first litter is loaded, the squad leaves the helicopter to obtain another litter patient. The second and third litters are loaded in the same way as the first one. After the three litter patients are loaded, the ambulatory patients are taken to the aircraft and directed to their seats.

d. Unloading Patients. The aircraft is unloaded in the reverse order of loading. The tiers are unloaded from bottom to top on one side and then on the other side. At the unloading command, the litter squad moves to the helicopter and the bearers take their proper places at the litter. The squad then performs its duties in the reverse order of loading.

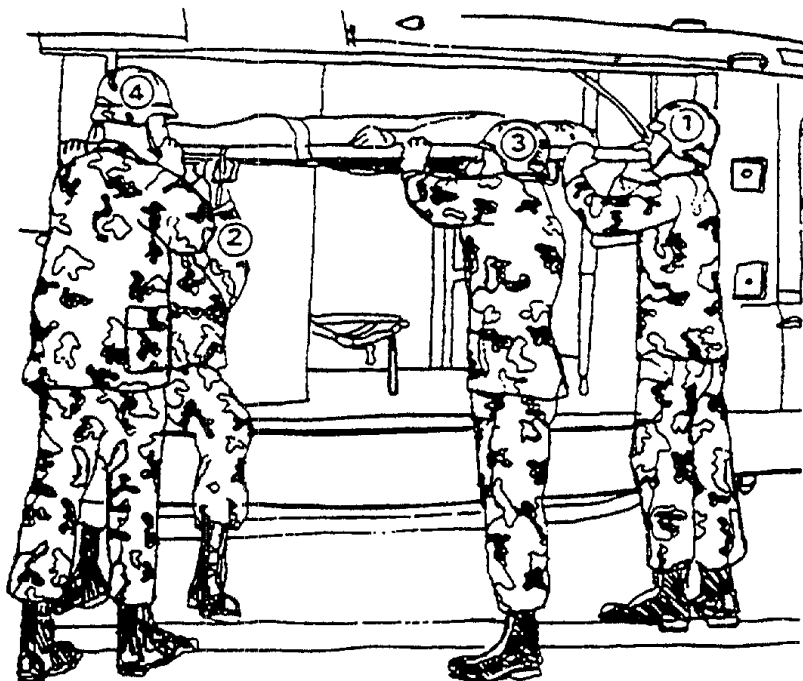


Figure G-50. Loading UH-1H/V From Right Side
(Step One)

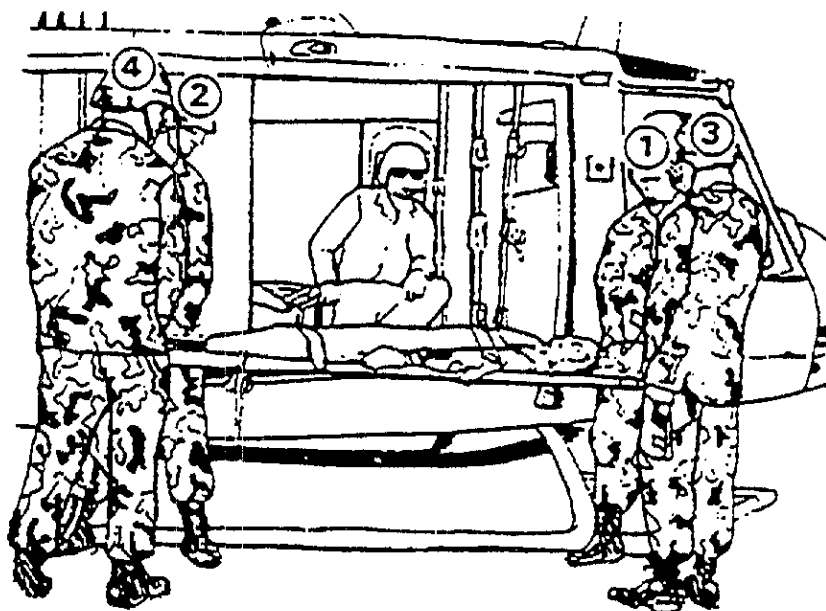


Figure G-51. Loading UH-1H/V From Right Side
(Step Two)

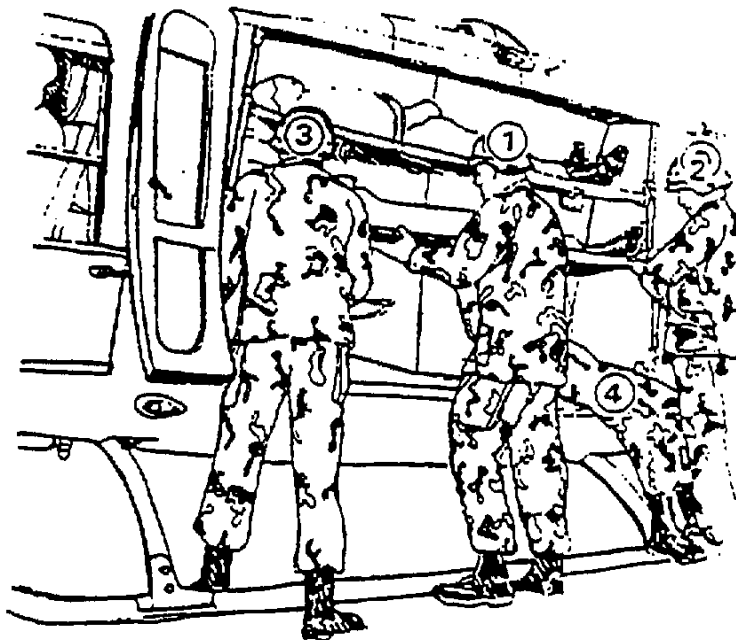


Figure G-52. Loading UH-1H/V From Left Side

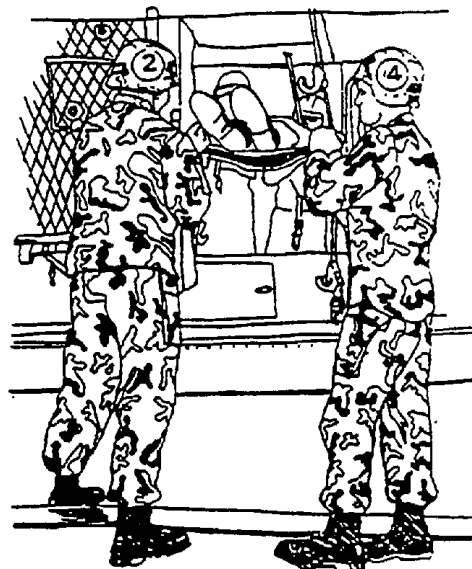


Figure G-53. Loading UH-1H/V
Litter Crosswise

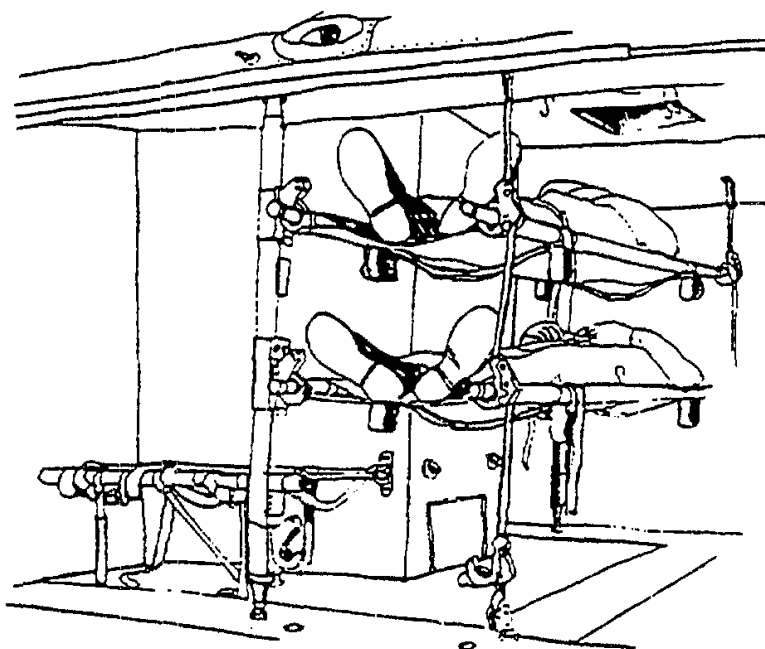


Figure G-54. UH-1H/V With Two Litters Loaded Crosswise

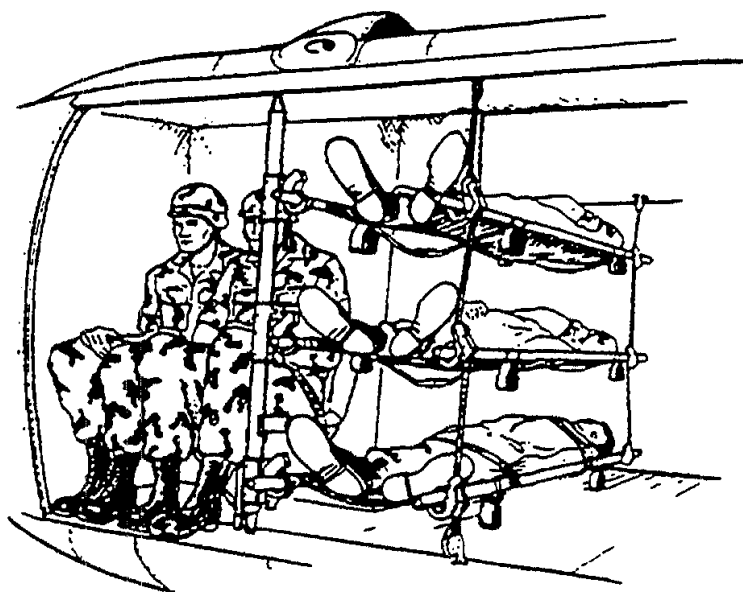


Figure G-55. UH-1H/V With Mixed Load of Litter and Ambulatory Patients

Section V

UNITED STATES ARMY NON-MEDICAL AIRCRAFT

G-38. General.

The US Army has both fixed-wing and rotary-wing aircraft. These aircraft are employed in both the CZ and COMMZ.

G-39. Army Fixed-Wing Aircraft.

The capability of Army fixed-wing aircraft to land on the take off from selected small, unprepared areas permits the evacuation of patients from AOs which would be inaccessible to larger aircraft. These aircraft can fly slowly and maintain a high degree of maneuverability. This capability further enhances their value in forward areas under combat conditions. Army fixed-wing aircraft are limited in speed and range as compared with larger transport-type aircraft. When adequate airfields are available (Figures G-56 and G-57), fixed-wing aircraft may be used in forward areas for patient evacuation. This is a secondary mission for these aircraft which will be used only to augment dedicated air ambulance capabilities (Field Manual 1-300 discusses airfield operations).

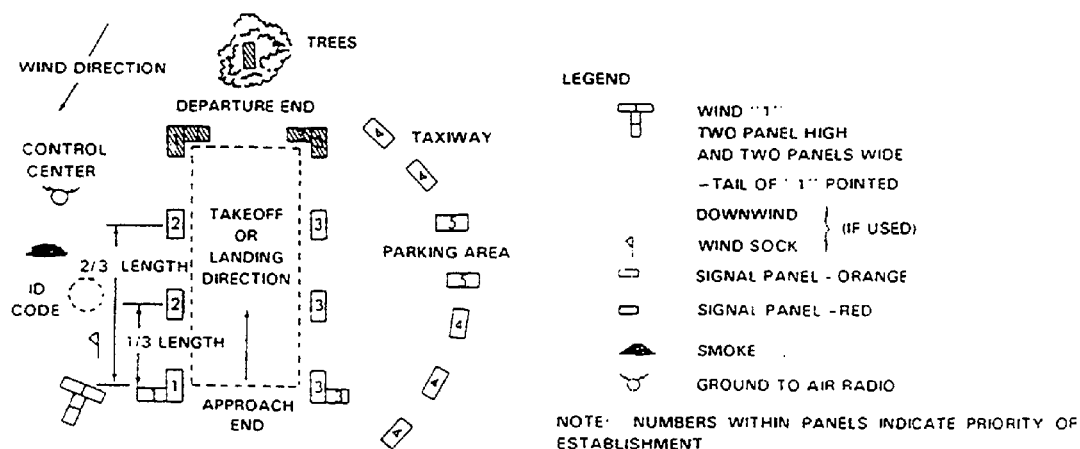


Figure G-56. Marking and Lighting of Airplane LZ (Day)

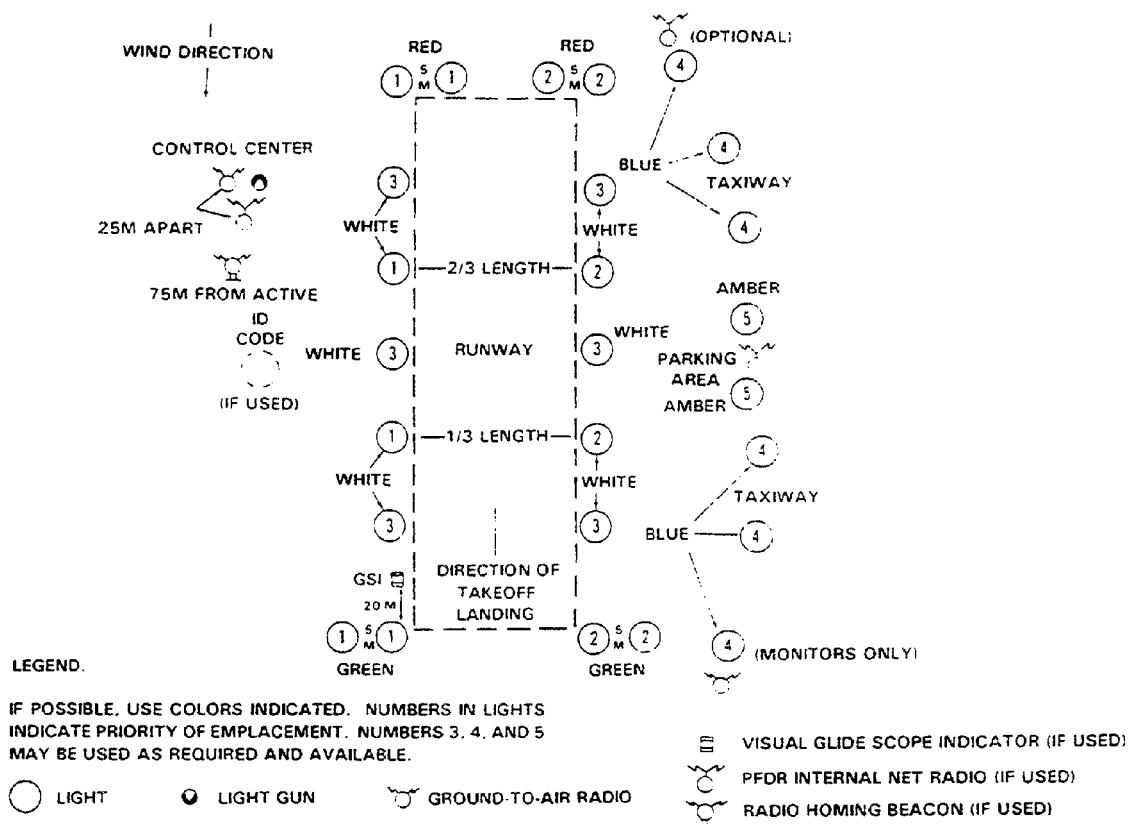


Figure G-57. Marking and Lighting of Airplane LZ (Night)

G-40. U-21/C-12 Aircraft.

The U-21 Ute and C-12 Huron are used as utility (U-21) and passenger/cargo (C-12) aircraft. These aircraft are not normally employed as evacuation aircraft. In emergency situations, both of these aircraft can be configured to evacuate litter and ambulatory patients.

a. The U-21 Ute is a twin turbine, propeller-driven utility aircraft with a normal cruise speed of 210 knots and an endurance of over 5 hours flying time. It is capable of accommodating ten ambulatory patients, or three litter patients plus three ambulatory patients and a medic.

b. The C-12 Huron is the newest addition to the Army's fixed-wing aircraft inventory. Depending on the model, its normal cruise speed ranges from 240 to 260 knots with five to six hours endurance. It is capable of carrying eight ambulatory patients, or two litter and four ambulatory.

G-41. Loading Patients Aboard Army fixed-Wing Aircraft.

The personnel who transport patients to the landing strip load the patients aboard the aircraft. They may be required to assist in configuring the aircraft for litters. Litters are generally loaded from the top downward and from the front to the rear. The four-man litter squad plus the crew chief or another member of the aircraft crew supervises the loading of all patients. Bearer number two normally enters the aircraft to assist the crew chief in loading the litters.

a. The CH-47 (Chinook) helicopter (Figure G-58), has a capacity of 24 litter patients, or 31 ambulatory patients, or a combination of litter and ambulatory patients. The aircraft's overall size and rotor blade diameter make it unsuitable for use in smaller or more confined areas.

b. The CH-47 helicopter should not be brought into a LZ that is smaller than 40 meters in diameter.

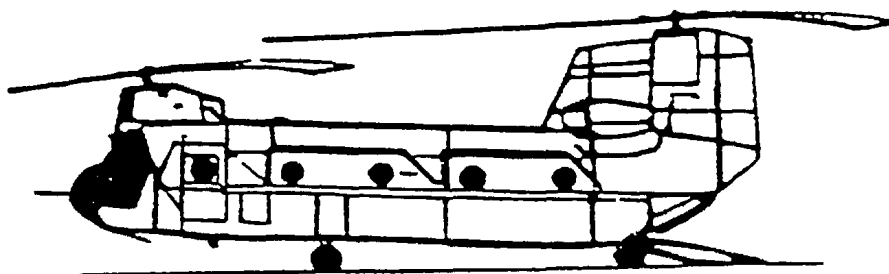


Figure G-58. CH-47 (Chinook) Helicopter

G-42. Loading Patients Aboard the CH-47 (Chinook) Helicopter.

a. Interior of the CH-47 (Chinook) Helicopter.

(1) This helicopter's maximum capacity is 24 litter patients or 31 ambulatory patients. The 31 ambulatory patients are seated in the ten three-man seats and the one-man seat as shown in view A of Figure G-59. The two one-man Seats are used by crew members.

(2) When carrying 24 litter patients, the seats are replaced with six tiers of litters, four litters high. The two one-man seats in the rear section should remain in place for the crew members. The one-man seat at the left front may also be left in place provided it is needed.

(3) The combinations of litter and ambulatory patients the CE-47 helicopter is capable of accommodating are provided in Table G-5.

Table G-5. Litter and Ambulatory Configuration of the CH-47 (Chinook) Helicopter

Ambulatory	Litter
31	0
25	4
19	8
16	12
10	16
4	20
1	24

b. Litter Support Kits. These kits are available for use in adapting the helicopter's interior to evacuate litter patients. These kits contain twelve litter poles, stored in the front of the cargo compartment and twelve litter straps, stored in overhead recesses. The poles contain safety attachments for securing them along the side walls of the compartment. The pull-down straps on the aisle side are secured to floor studs. Permanently attached to each litter pole and each strap are four litter support brackets with locking devices for securing litter handles in place. It is not necessary to remove the seats before adapting the compartment for litter patients. The seats can be folded against the wall and strapped in place.

c. Loading of Litter Patients. The loading of litter patients aboard the CH-47 helicopter is similar to loading patients aboard the UH-1H/V air ambulance except the litter squad is not assisted by the crew members. In a two-man carry, the litter squad carries each litter patient through the lowered rear door and ramp to the litter rack where lie is to be placed. The squad then moves into a four-man carry and places the litter patient into the appropriate tier. The litter racks should be loaded from front to rear and from top to bottom. Litter patients requiring in-flight medical care should be positioned to facilitate this care. If the helicopter is to be loaded with a combination of litter and ambulatory patients, the litter patients should be positioned to the rear of the ambulatory patients whenever possible.

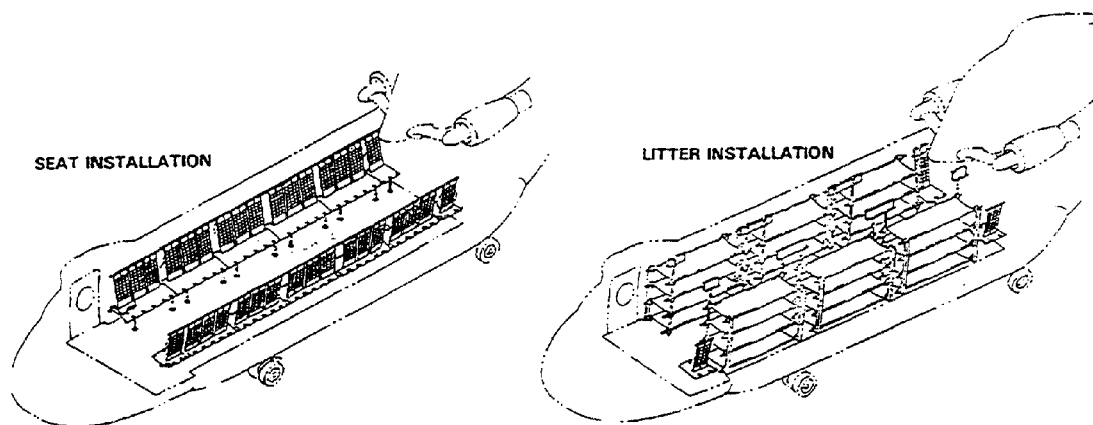


Figure G-59. Interior View of CH-47 (Chinook) Helicopter

Section VI

UNITED STATES AIR FORCE AIRCRAFT

G-43. General.

Most USAF cargo aircraft can be used for aeromedical evacuation. The aircraft used for the forward airlift movement of troops and supplies may be reconfigured for the aeromedical evacuation mission on the return flight (provided proper equipment is available).

Section VII

TYPES OF LITTERS

G-44. General.

After patients are picked up on a forward area by litter bearers, they may be moved by surface or air assets to points as far to the rear as required by their medical condition. The patient who must be transported on a litter is referred to as a litter patient.

G-45. Types of Litters.

A litter may be pre-fabricated or may be improvised from available materials. The Armed Forces use several types of standard litters. This standardization allows a patient to travel in various vehicles on the same litter; thereby, minimizing the possibility of further injury and saving valuable time.

a. Standard Litters. Standard litters are pre-fabricated and may have accessories to be used with them.

(2) The standard collapsible litter is the most widely used (Figure G-60). It folds along the long axis only.

(a) The basic components of the litter and their functions are provided below:

1 Two straight, rigid, lightweight aluminum poles.

2 A cover (bed) of cotton duck.

3 Four wooden handles attached to the poles.

4 Four stirrups (one bolted near the end of each pole). The stirrups support the litter when it is placed on the ground.

5 Two spreader bars (one near each end of the litter). These bars are extended crosswise at the stirrups to hold the cover taut when the litter is open.

6 Two litter securing straps (one attached to each pole at the stirrup bolts). These straps are used to secure the litter when it is closed.

7 Accessories such as patient securing straps.

(b) Dimensions of the standard collapsible litters are as follows:

1 Overall length is 90 inches.

2 Overall width is 22 7/8 inches.

3 Bed length is 72 inches.

4 Bed width is 22 7/8 inches.

5 Weight is 15 pounds.

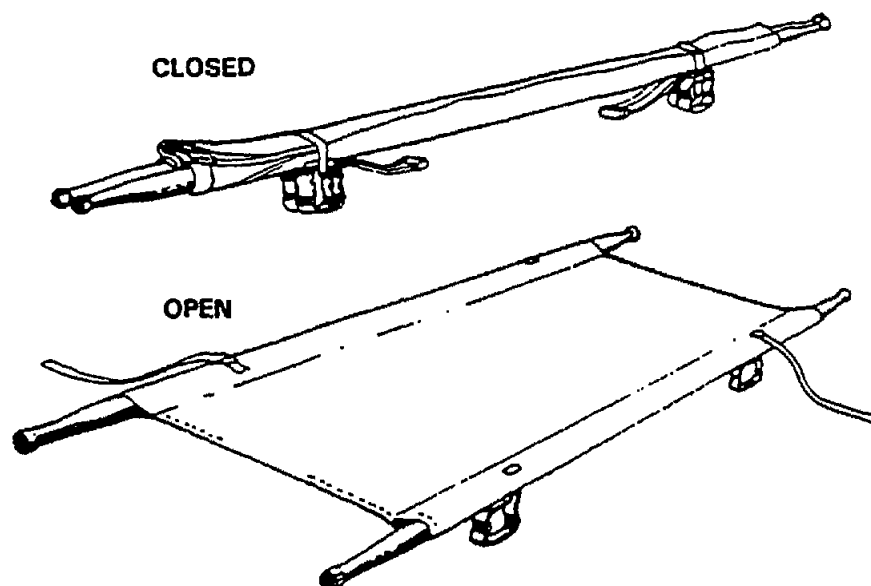


Figure G-60. Standard Collapsible Litter

(2) The patient securing strap (Figure G-61) is used to hold the patient in position on the litter. It is designed to fit the straight and folding aluminum litters as well as other standard litters. It is available in quantities of four per litter. This strap can also be used with an improvised litter and as a patient restraint, if required. It is made from a 6-foot length of 2-inch webbing and a buckle with a locking device and spring.

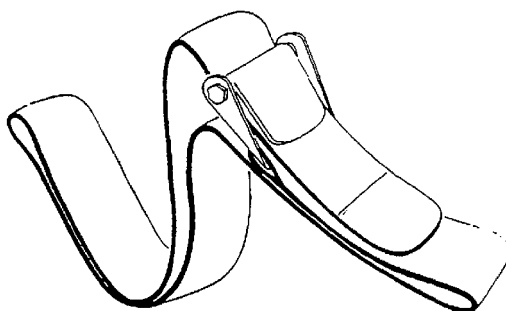


Figure G-61. Patient Securing Strap

(3) Another standard litter, with the same general dimensions when open, is the folding aluminum litter. It has folding lightweight aluminum poles (Figure G-62). The poles can be folded to one-half their length when the litter is not in use.

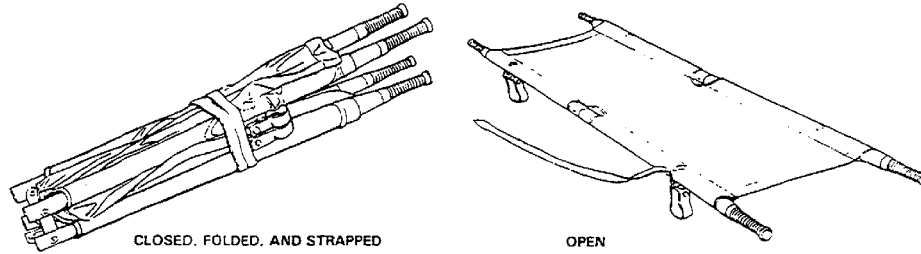


Figure G-62. Folding Aluminum Litter

(4) The pole-less semi-rigid litter (Figure 6-63) is useful in evacuating patients from ships and in mountainous areas. It holds the patient securely in position and facilitates the movement of the patient in a vertical position. The dimensions of this litter are overall length, 83 3/4 inches; overall width, 22 3/4 inches; and its weight is 18 3/4 pounds. The basic components and their functions are:

- (a) Semi-rigid cotton duck with wooden supports.
- (b) Four webbing handles (two at each end). These straps can be used when the litter is carried by four bearers.
- (c) Four loops. These loops are used to insert the poles for carrying.
- (d) Headpiece. This is used to support the patient's head.
- (e) Seven patient securing straps. These straps are used to secure the patient to the litter.

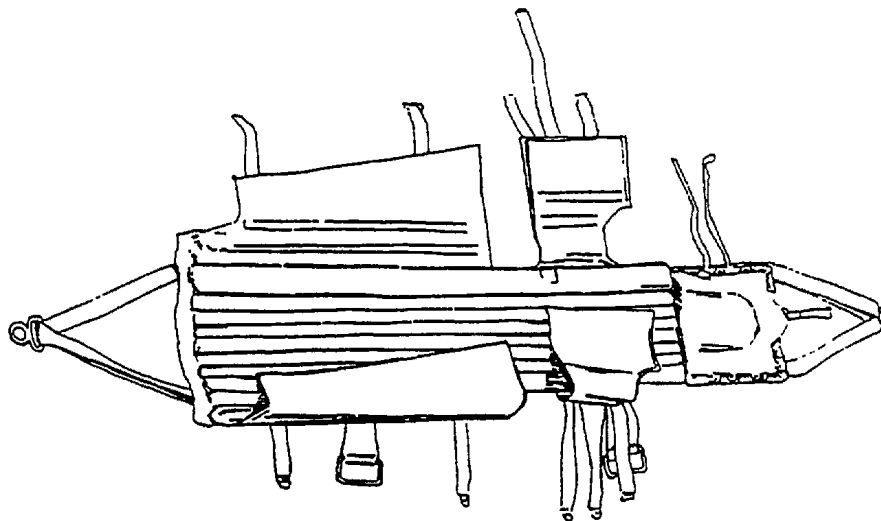


Figure G-63. Poleless Semi-Rigid Litter

(5) The poleless non-rigid litter (Figure G-64) can be folded and carried by the combat medic. It has folds into which improvised poles can be inserted for evacuation over long distances. It also has slings for hoisting, lowering, and carrying, and patient securing straps to secure the patient to the litter.

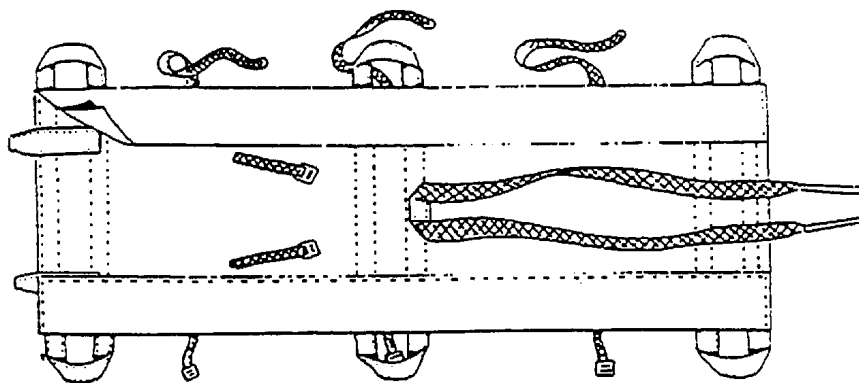


Figure G-64. Poleless Non-Rigid Litter

(6) The Stokes litter (Figure G-65) affords maximum security for the patient when the litter is tilted. (For additional information, refer to paragraph 11-32, FM 8-10-6.) The basic components of the litter and their functions, and its dimensions are provided below.

(a) It is composed of a steel or aluminum tubular frame supporting a bed of wire mesh netting. It also has wooden support slats to support the patient's back.

(b) The lower half is divided into two compartments to accommodate the patient's legs.

(c) It has four webbing patient securing straps for use in securing the patients.

(d) It has ropes, cables, or steel rings which can be attached to the litter as required for vertical recoveries.

(e) Its' dimensions are length, 84 inches; width, 23 inches; and weight, 31 1/2 pounds.

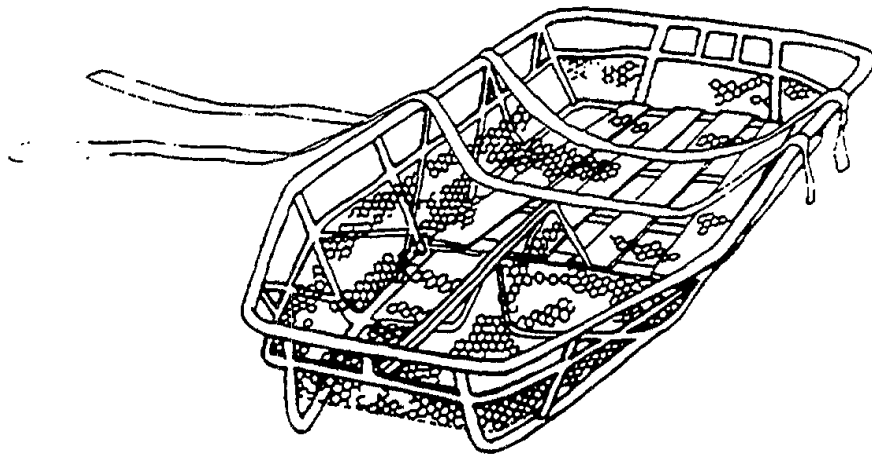


Figure G-65. Stokes Litter

(7) The SKED litter (Figure G-66) is a compact and lightweight transport system used to evacuate a patient over land. It may also be used to rescue a patient in the water. Detailed information on this system is contained in paragraphs 11-27 thru 11-30, FM 8-10-6.

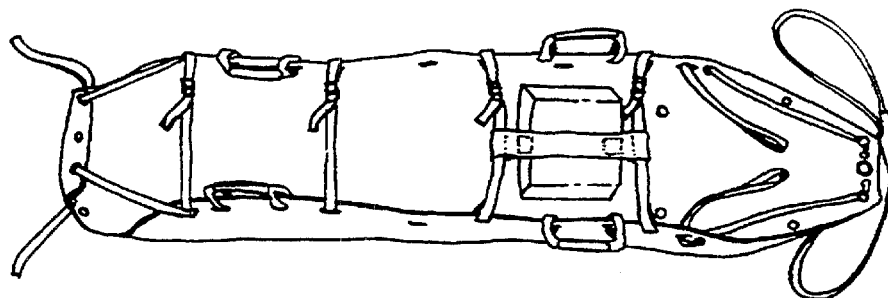


Figure G-66. SKED Litter

b. Improvised Litters. Improvised litters are those made from various materials normally available in the forward area.

(1) There are times when a patient may have to be moved and a standard litter is not available. The distance may be too great for manual carries, or the patient may have an injury (such as a fractured neck, back, hip, or thigh) that would be aggravated by manual transportation. In these situations, litters can be improvised from materials at hand. Improvised litters must be as well constructed as possible to avoid the risk of dropping or further injuring the patient. Improvised litters are emergency measures and must be replaced by standard litters at the first opportunity.

(2) Many different types of litters can be improvised, depending upon the materials available. A satisfactory litter can be made by securing poles inside such items as a blanket (Figure G-67), poncho, shelter half, tarpaulin, mattress cover, jacket, shirts (Figure G-68), or bed ticks, bags, and sacks (Figure G-69). Poles can be improvised from strong branches, tent poles, skis, lengths of pipe, and other objects. If objects for improvising poles are not available, a blanket, poncho, or similar item can be rolled from both sides toward the center so that rolls can be gripped for carrying a patient (Figure G-70). Most flat-surface objects of suitable size can be used as litters. Such objects include doors, boards, window shutters, benches, ladders, cots, and chairs. If possible, these objects should be padded for patient comfort.

(a) To improvise a litter using a blanket and poles, the following steps should be used:

1 Open the blanket and lay one pole lengthwise across the center; then fold the blanket over the pole.

2 Place the second pole across the center of the folded blanket.

3 Fold the free edges of the blanket over the second pole and across to the first pole.

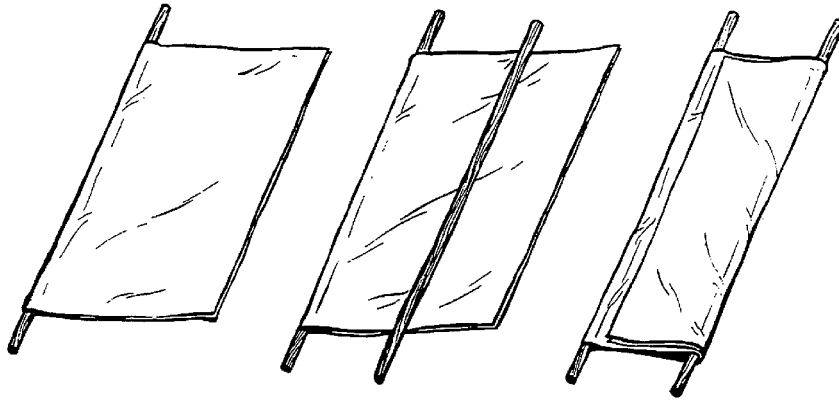


Figure G-67. Litter Made With Blanket and Poles

(b) To improvise a litter using shirts or jackets, button the shirt or jacket and turn it inside out, leaving sleeves inside, then pass pole through the sleeves.

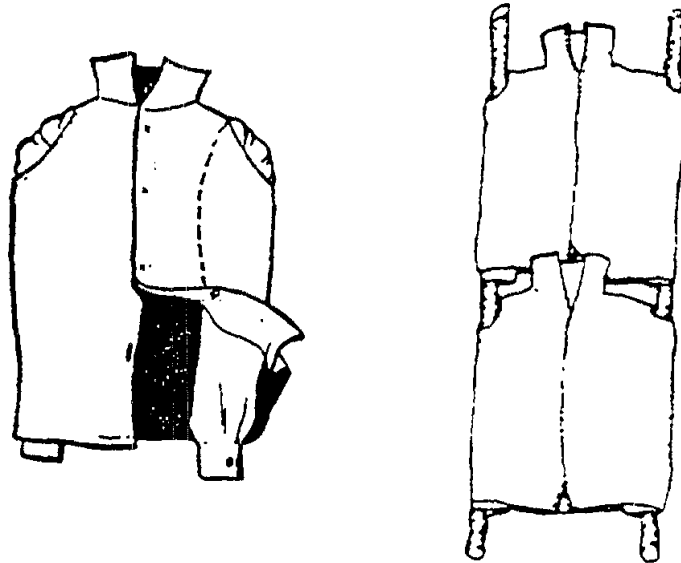


Figure G-68. Litter Improvised From Jackets and Poles

(c) To improvise a litter from bed sacks and poles, rip open the corners of bed ticks, bags, or sacks; then pass the poles through them.

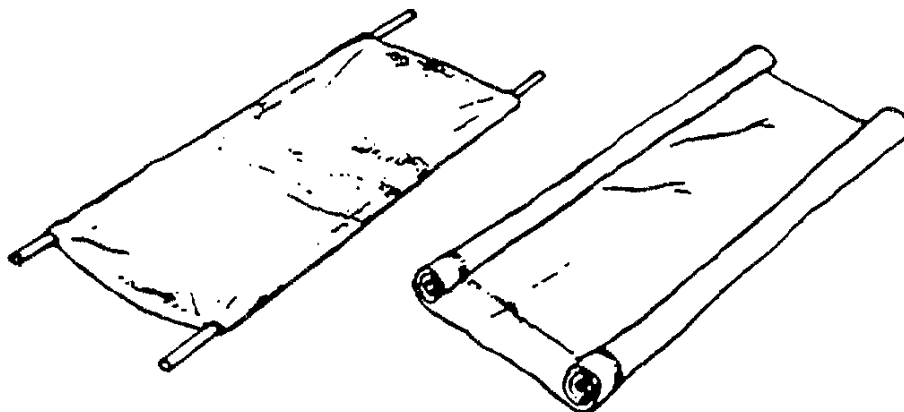


Figure G-69. Litter Improvised From Bed Sacks and Poles

(d) If no poles are available, roll a blanket, shelter half, tarpaulin, or similar item from both sides toward the center. Grip the rolls to carry the patient.



Figure G-70. Rolled Blanket Used as Litter

G-46. Dressed Litter.

A litter is dressed with one, two, or three blankets (Figure G-71 thru G-73) to reduce the danger of shock and to afford warmth and comfort during transport. In an NBC environment, the litter should be dressed with an impermeable cover (rubber poncho or similar material). This cover is folded over the patient to prevent additional exposure to contaminants. If an impermeable cover is not available, a blanket can be used.

a. To dress a litter with one blanket (Figure G-71), place the blanket diagonally over the litter. After the patient is placed on the litter, bring the sides of the blanket over the patient and tuck in the edges at his head and feet.

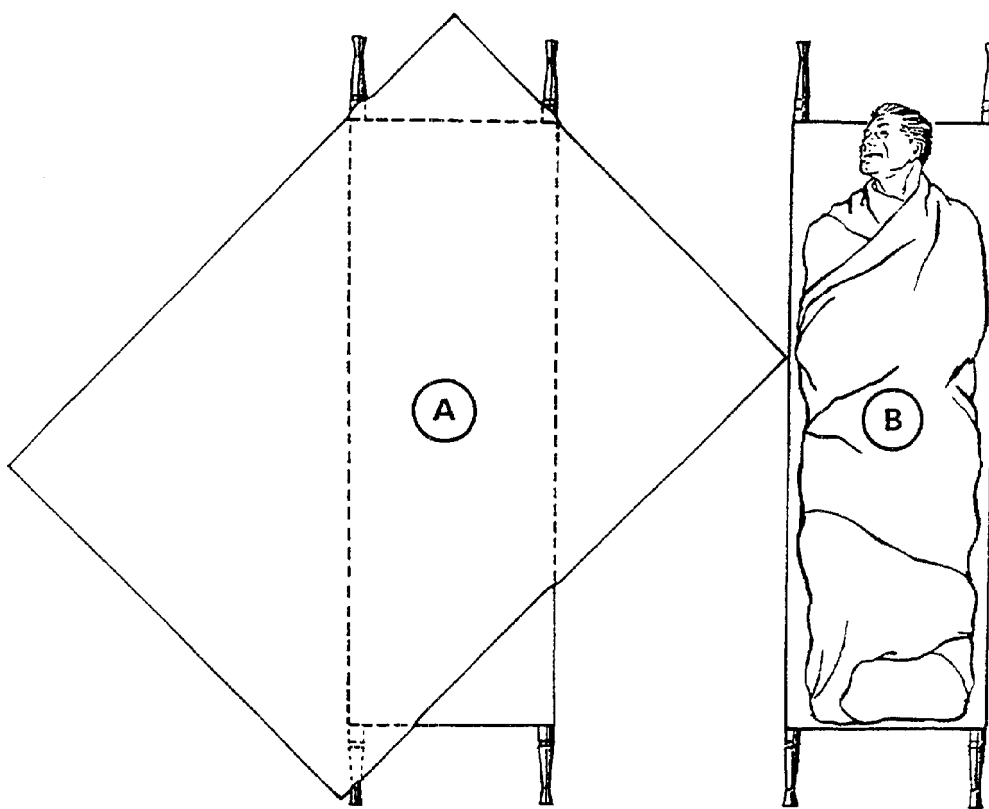


Figure G-71. Dressing the Litter With One Blanket

b. To dress a litter with two blankets (Figure G-72), place the first blanket lengthwise across the litter with the blanket edge just beyond the head end of the litter. The second blanket is folded in thirds, lengthwise, and placed over the first blanket. Let the upper edge of the second blanket drop about 10 inches below the upper edge of the first one. open the folds on the second blanket about two feet from the foot end.

After the patient is placed on the litter, bring the bottom of the blanket up and over the patient's feet. Leave a small fold between his feet. Tuck the two folds closely over and around his feet and ankles. Finally, wrap the patient with one side and then the opposite side of the first blanket.

NOTE

If the patient to be on the litter is tall, the blanket should be placed lower on the litter.

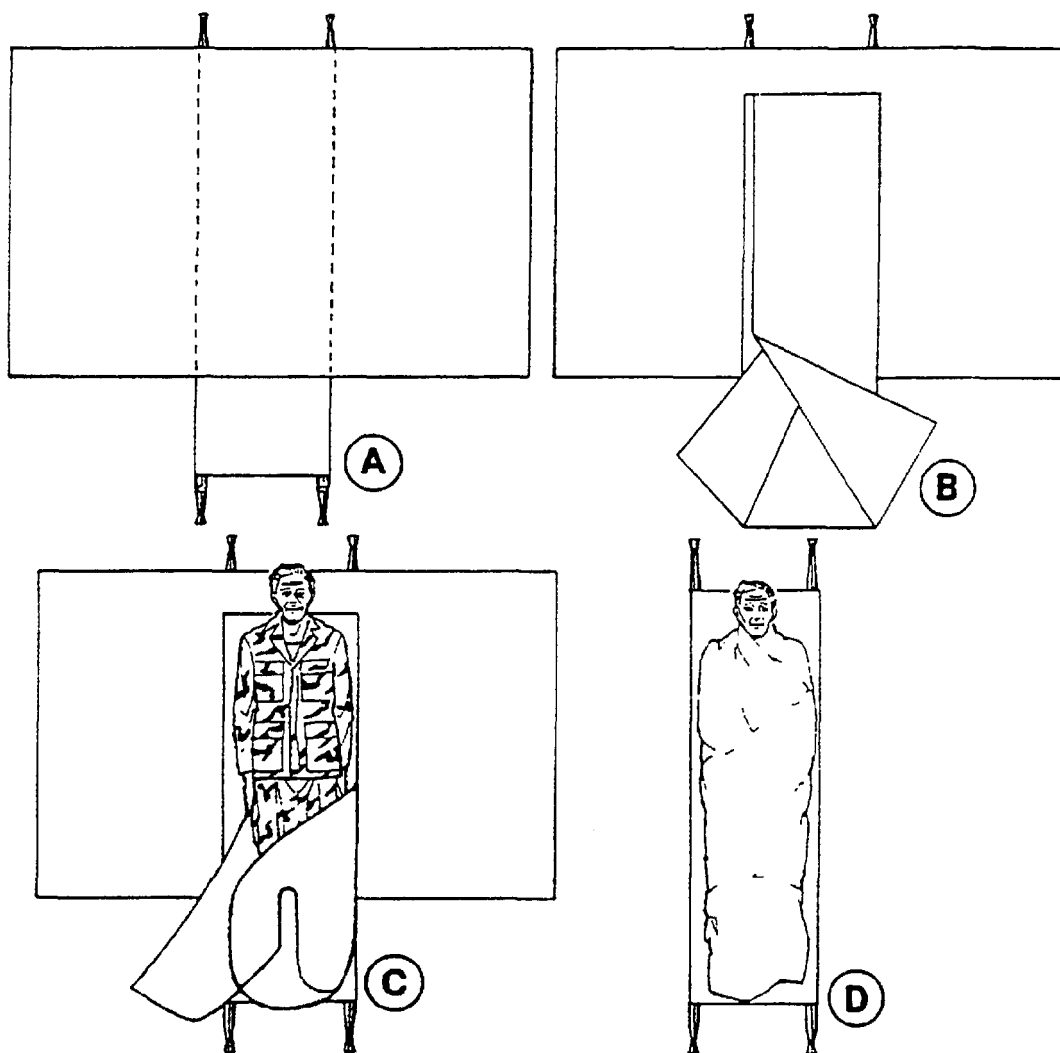


Figure G-72. Dressing the Litter With Two Blankets

c. To dress a litter with three blankets (Figure G-73), place the first blanket on the litter lengthwise so that one edge is even with the litter pole farthest from you. The upper end of the blanket is even with the head of the canvas. Fold the blanket back upon itself once, so that the folded edge is along the litter pole nearer you and the outer edge of the blanket overhangs the other pole. Place the second blanket lengthwise over the first one as described above, except start with the opposite litter pole so that the blanket overhang is on the opposite side of the first blanket. After the patient is placed on the litter, fold the third blanket once lengthwise and place it over the patient with one end under his chin. Fold the overhanging edges of the first two blankets over the third blanket and secure them in place with safety pins or patient securing straps.

NOTE

This method of dressing the litter gives you four thicknesses of blanket over and under the patient. This provides additional warmth and will help in preventing shock.

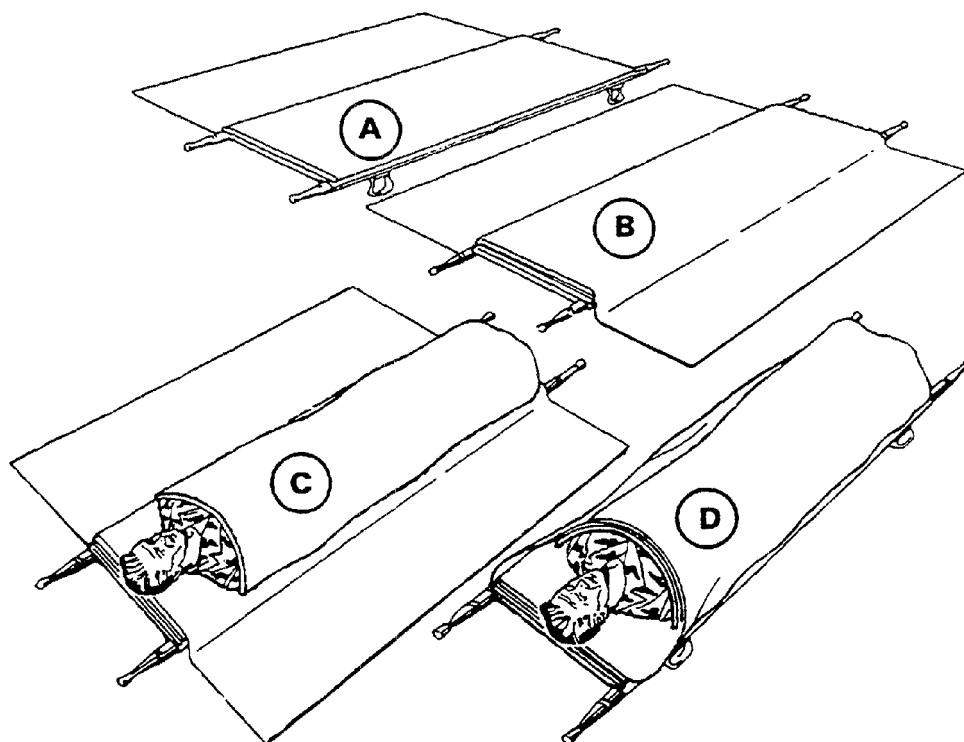


Figure G-73. Dressing the Litter With Three Blankets

G-47. Using Patient Securing Straps.

After the patient is placed on the dressed litter and covered, the patient securing straps are used to hold him in position. The number of straps and the body parts over which they should be placed depend upon the type of terrain over which the patient is to be carried (Figure G-74).

a. If only two straps are necessary, put one strap across the chest and one across the legs, just below the knees. Extend the straps under the litter and buckle them against the litter pole.

b. If the terrain is rough, apply two additional straps. One is placed across the waist and the other across the thighs. Again, extend them under the litter and buckle them against the litter pole.

c. If the patient is being carried either up or down steep slopes, use the two additional straps to secure each thigh to the litter separately. Take one strap over one thigh, under the other thigh, then under the litter, and buckle it against the litter pole. Take the remaining strap and secure the opposite thigh in the same manner.

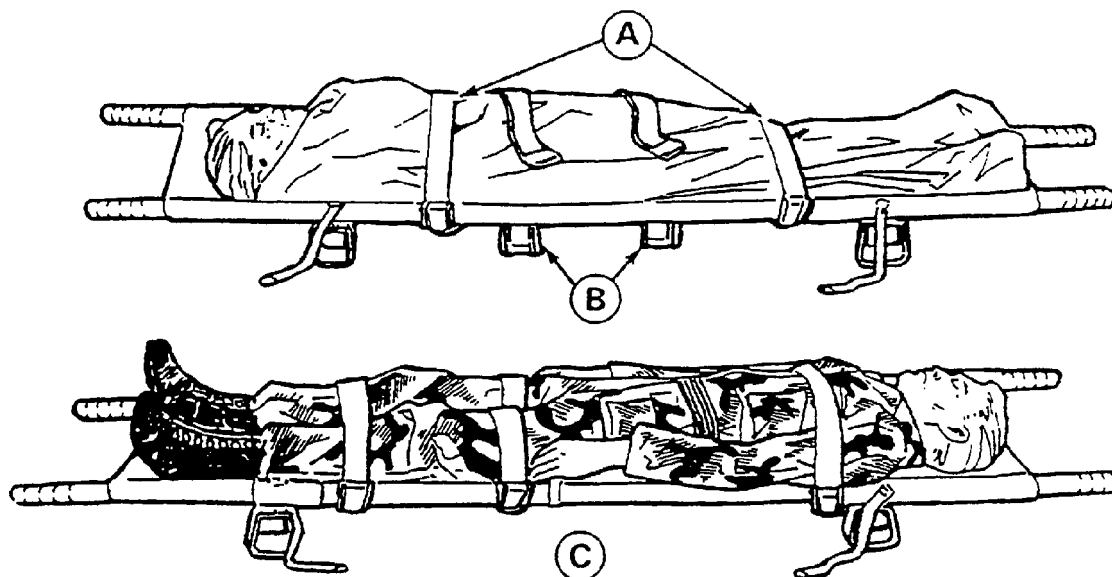


Figure G-74. Using Patient Securing Straps

G-48. General Rules for Litter Bearers.

In addition to the bearer rules addressed in paragraph 8-4, the following rules also apply:

a. In moving a patient, the litter bearers must make every movement deliberately and as gently as possible. The command STEADY should be used to prevent undue haste.

b. The rear bearers should watch the movements of the front bearers and time their movements accordingly to ensure a smooth and steady action.

c. The litter must be kept as level as possible at all times, particularly when crossing obstacles, such as ditches.

d. Normally, the patient should be carried on the litter feet first, except when going uphill or upstairs; his head should then be forward. If the patient has a fracture of a lower extremity, he should be carried uphill or upstairs feet first and downhill or downstairs head first to prevent the weight of the body from pressing upon the injured part.

e. When the patient is loaded on a litter, his individual equipment is carried by two of the bearers or placed on the litter.

G-49. Use of Spine Boards and the Kendrick's Extrication Device.

Spine boards and the KED aid in rescuing and immobilizing patients with known or suspected spinal fractures. Spine boards can be prefabricated from plywood or any suitable material (Figure G-75).

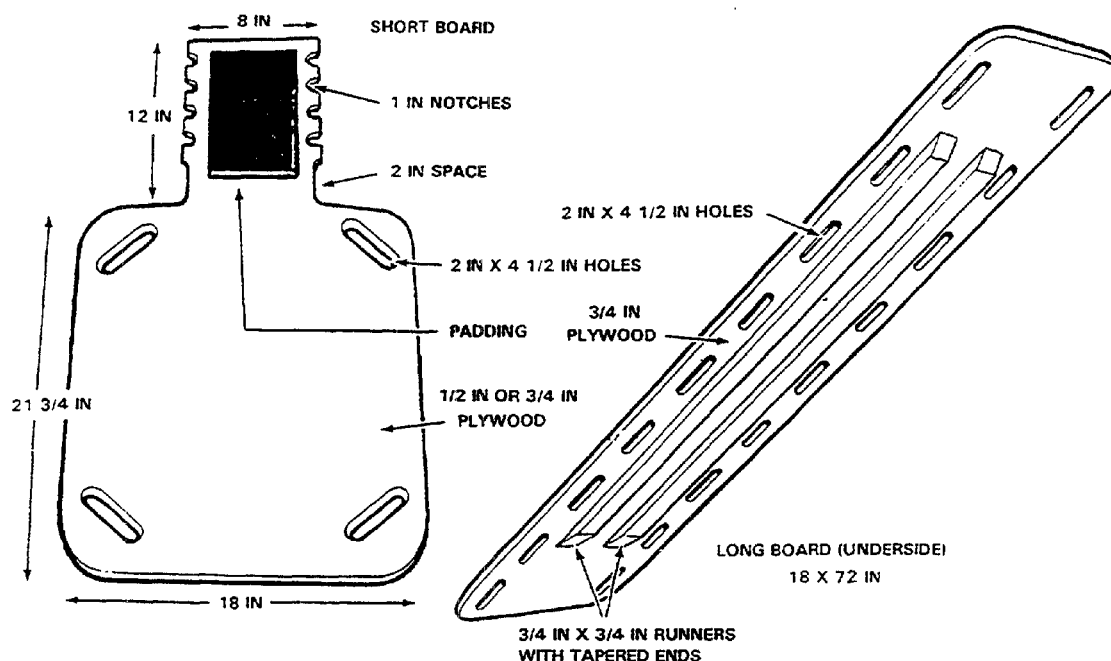


Figure G-75. Pre-Fabricated Spine Boards (Short and Long)

a. Short Spine Board. When a patient has a fracture or suspected fracture of the neck, the short spine board is applied from the waist up to immobilize the upper spine before moving him (Figure G-76). The patient is then lifted onto a long spine board (c. below). To apply the short spine board, the bearers assemble the required items: a short spine board, a cervical collar, two 6-foot patient securing straps, and a cravat. If an item is not available, the bearers should improvise from any available material.

(1) Bearer number one places his hands on each side of the patient's head and jaws. He then applies slight upward traction to the neck while bearer number two inserts a cervical collar around the patient's neck.

(2) Bearer number one maintains a slight upward traction while bearer number two inserts the short spine board behind the patient's back. He then applies the cravat and the two patient securing straps (Figure G-76) in the following order:

(a) Cravat. The center of the cravat is placed across the patient's forehead with the middle of the cravat covering the hairline. The ends are inserted into the bottom notches of the board and are tied in the back.

(b) First strap. The buckle of the first patient securing strap is placed in the patient's lap and the other end is passed through the lower hole in the board. It is brought up the back of the board, through the top hole, under the armpit, over the shoulder, and across the back of the board at the neck. The end is then attached to the second strap.

(c) Second strap. The second patient securing strap is buckled to the first one, letting the buckle rest on the side of the board at the neck. The other end of the second strap is passed over the shoulder, under the armpit, through the top hole in the board, down the back of the board, and through the lower hole. It is then taken across the patient's lap, where it is secured in place by buckling it to the first strap.



Figure G-76. Application of Short Spine Board

NOTE

If available, bearer number two will apply a rigid cervical collar.

b. Kendrick's Extrication Device (KED). The KED (Figure G-77) is a pre-fabricated flexible type of short spine board. It is useful in extricating a patient suspected of having spinal injuries, especially if the patient is in the sitting position.

(1) Bearer number one maintains cervical traction until the KED has been completely applied.

(2) Bearer number two applies a rigid cervical collar, places the KED behind the patient, puts a cushion behind the patient's head to align the KED, fastens the trunk straps, then the leg/hip straps, and then the forehead strap and chin strap.

(3) Bearer number three ties the hands of the patient together and places the patient on the long board.

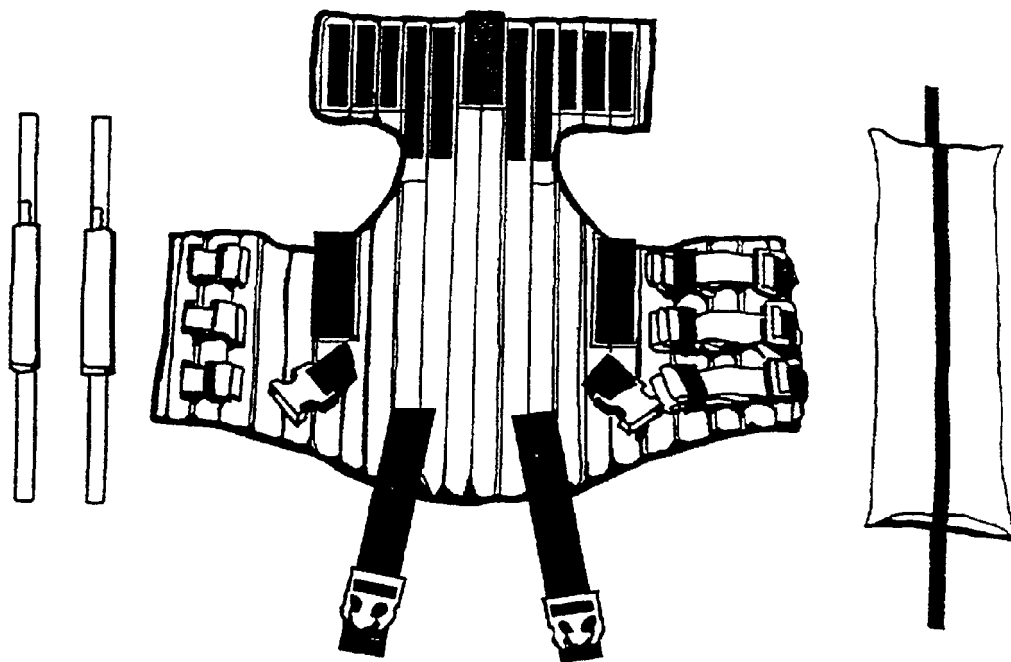


Figure G-77. Kendrick's Extrication Device

c. Long Spine Board. When a patient has a fracture or suspected fracture of the back as well as the neck (6a.), he is placed on a long spine board (Figures G-78 and G-80). To apply the long spine board, the bearers assemble the required items: a long spine board, four 6-foot patient securing straps, a cravat,

and four pieces of padding. If an item is not available, the bearers should improvise it from any available material.

(1) The bearers place the spine board beside the patient. They align it with his body. They then place padding on the board at the points where the patient's neck, small of the back, knees, and ankles will rest.

(2) Bearer number one kneels at the patient's head. He places his hands on each side of the patient's head and jaws, immobilizing the head and neck and applying slight traction (Figure G-78). Bearer numbers two, three, and four kneel on one side of the patient and place their hands on the opposite side at the patient's shoulder and waist, hip and thigh, knee and ankle (Figure G-79).



Figure G-78. Positioning of Hands

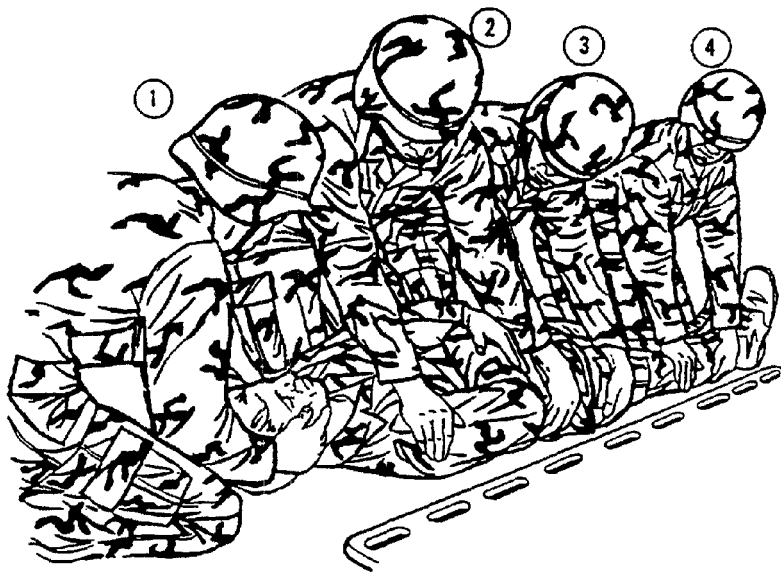


Figure G-79. Positioning of Litter Bearers

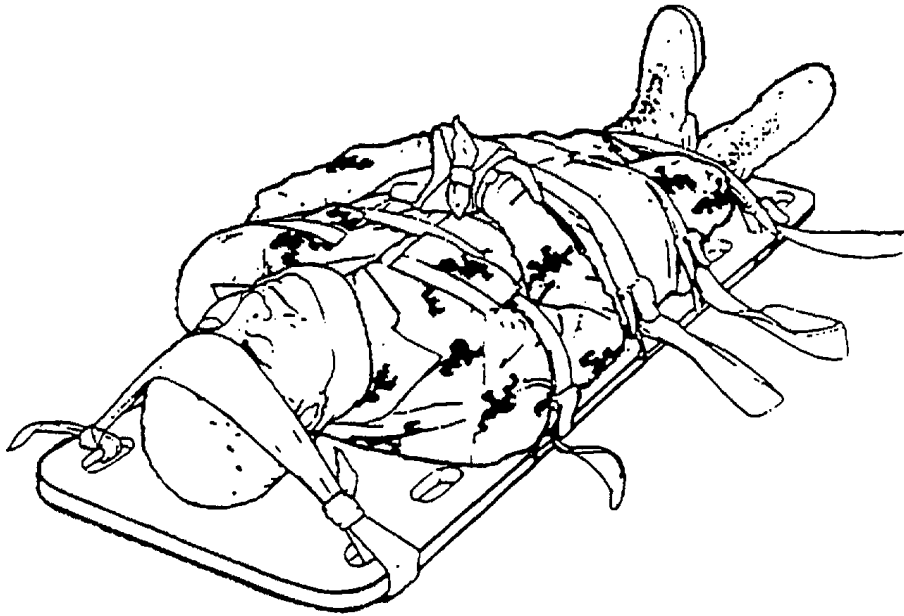


Figure G-80. Application of Long Spine Board

(3) Bearer numbers two, three, and four roll the patient body slightly toward them as bearer number one turns the patient's head, keeping it in a straight line with the spine.

(4) Bearer number three reaches across the patient's body with one hand, grasps the board at the nearer edge and slides it against the patient. Bearer number three, with the same hand, reaches across the board to the far edge and holds the board in place. All the bearers then slowly roll the patient backward onto the board, keeping the head and spine in a straight line.

(5) While bearer number one continues to apply slight traction to the neck, bearers numbers two, three and four immobilize the patient by applying the cravat and four patient securing straps in the following order:

(a) Cravat. The center of the cravat is placed over the patient's forehead with the middle of the cravat covering the hairline. The ends are then extended straight across and inserted through the nearest holes on each side of the board.

(b) First strap. One end of the first patient securing strap is inserted through the board hole near the chest, across the chest, and through the hole on the opposite side. It is then brought back across the arms and buckled to the other end of the strap. The buckle rests on the top of the board, not against the patient.

(c) Remaining straps. The three remaining straps are applied: one across the hips, one above the knees (not over the knee caps), and one above the ankles. One end of each strap is inserted through the board hole near the body part and buckled to the other end of the strap. The buckle rests on the top of the board, not against the patient.

G-50. Travois.

A travois is a crude sled lashed to a horse or similar animal and dragged along the ground. It can also be lashed between two animals in single file and carried level. The sled is made from two long poles fastened together by two crossbars and a litter bed fastened to the poles and crossbars. The patient is secured on the litter bed. If the sled is pulled by only one animal, the bearers lift the dragging end from the ground when going uphill, fording streams, or crossing obstacles. To make a travois:

a. Cut two poles about 16-feet long (one pole should be 8 to 10-inches longer than the other). Ensure that the small ends are at least 2 inches in diameter. Then cut two crossbars which are about 3-feet long.

b. Lay the poles parallel to each other. They should be placed about 2 1/2 feet apart with the larger ends to the front. If only one animal is used, let the smaller ends spread apart about 3 feet and have one of the small ends project 8 to 10 inches beyond the other one. This results in a rocking motion, rather than a jolting motion to the patient.

c. Notch the poles and the crossbars so that the poles can be connected with one crossbar about six feet from the front end and the other crossbar about six feet to the rear of the first one. Fit the notches in the crossbars and poles together and lace them securely in place.

d. Make a litter bed six feet long between the crossbars. This is done by fastening a blanket, canvas, or similar material securely to the poles and crossbars.

NOTE

A rope or strap may be stretched diagonally from pole-to-pole, letting it cross many times to form a base for an improvised bed. A litter or cot may also be fastened between the poles for the same purpose.

e. If only one animal is used, securely fasten the front ends of the poles to the saddle of the animal. Leave the other ends of the poles on the ground.

f. If two animals are used, securely fasten the front ends of the poles to the saddle of the lead animal and the other of the poles to the saddle of the animal which follows.

G-51. Packsaddle Litter.

A packsaddle litter can be improvised by fitting a suitable litter onto the packsaddle of a mule or other animal. This technique is particularly useful in jungle and mountain areas where it may be necessary to carry a litter patient for a long distance.

G-52. Litter Evacuation in Extreme Cold Weather Operations.

Patient treatment and handling under conditions of extreme cold and deep snow equates to:

- a. Prompt collection of patients.
- b. Emergency medical treatment.
- c. Prevention of shock.
- d. Rapid evacuation to locations where they can be kept warm.

(1) Emergency Medical Treatment. Treatment is limited to controlling hemorrhage, clearing the airway, preventing and treating infection, and splinting fractures. This treatment is modified depending on the weather, the type of clothing worn by the patient, and the judgment of the person giving the treatment.

(2) Preventing Shock. Cold hastens the progress of shock and lessens the chances of recovery if a patient is exposed to a cold environment for any length of time. It is particularly important to guard against shock by conserving body heat. Therefore, at the earliest possible moment, patients must be placed in specially constructed evacuations bags. When evacuation bags are not available, arctic sleeping bags or other similar articles may be used.

G-55. Aids to Litter Evacuation in Extreme Cold Weather Operations. (Reference FM 8-10-6, Chapter 9)

Litter evacuation is difficult under conditions of extreme cold and deep snow. Litter bearers are subject to excessive fatigue and possible cold injury. For this reason, litter aids which are either hand-drawn by litter bearers, animal-drawn, or vehicle-towed should be used whenever possible.

- a. Litter Kit, Ski Sled. The litter kit, ski sled, is used for converting a pair of skis and ski poles to a sled for

transporting patients. It consists of one canvas platform, four brackets, two cross braces, two 2.13-meter and two 8.23-meter lengths of rope, and two patient securing straps.

b. Ski Adapters. Two ski adapters are attached to each of two skis; then the adapters are clamped onto the litter stirrups of a standard litter. With ropes attached to the converted litter, a litter patient can be easily pulled over the surface of the snow.

c. Ahkio. The Ahkio (Alaskan sled) is particularly useful where patients must be evacuated through deep snow.

d. Evacuation Bag, Patient. The patient evacuation bag is issued in cold climates to keep the patient warm. It zips up to protect the entire patient. Blankets may also be used inside the evacuation bag for added protection.

G-54. Litter Evacuation in Mountain Operations.

a. Personnel assigned to litter squads for mountain service must be trained in:

- (1) Rock climbing.
- (2) Use of ropes.
- (3) Individual and unit movements at high altitudes.

b. Because of the conditions in mountain operations, a litter squad is normally increased from four to six men.

c. For additionally information on -medical evacuation over mountainous terrain, refer to paragraphs 5-2, 9-12 thru 9-14, and 11-15, FM 8-10-6.

G-55. Techniques for Litter Evacuation in Mountain Operations.

The evacuation techniques used in mountain operations are **well** proven. They are, however, subject to improvement and should be modified as better methods of patient handling are developed. When evacuating a patient from mountainous areas:

- a. Select the smoothest available route.
- b. Keep the patient as warm as possible and avoid unnecessary handling.
- c. Place the patient's helmet on his head for protection from falling rocks.
- d. If the evacuation route is long and difficult to travel, a series of litter relay points or warming stations

should be established. Warming stations, if established, should be staffed with medical personnel to permit proper treatment of shock, hemorrhage, or other emergency conditions.

e. If a patient develops new or increased signs of shock while being evacuated, he should be treated and retained at one of the warming stations until his condition permits further evacuation.

G-56. Types of Litters for Mountain Operations.

There are four types of litters available for evacuation of casualties over rough mountain terrain. They are the standard collapsible litter; the Poleless Semi-Rigid litter; the Stokes litter; and the SKED litter. When using the Standard Collapsible litter and patient securing straps are not available, it is necessary to secure a patient to the litter with a rope.

G-57. Methods of Litter Evacuation in Mountain Operations.

Several litter evacuation methods that are adaptable to mountain terrain and climatic conditions are discussed.

a. Modified Travois (Descending). This method is used when descending relatively smooth slopes. Considerable speed can be made on slopes and cliff faces which are four to six feet high. These areas can be passed without much difficulty.

(1) Two poles about 18 feet long and about 3 inches in diameter at the large end are cut. These poles are fastened to the litter stirrups. About 5 to 10 feet of these poles should extend beyond the litter to serve as runners.

(2) One bearer supports the foot of the litter by a rope sling and guides the litter downhill. Another bearer uses a rope to lower the patient and the litter. A third bearer assists the soldier holding the rope and relieves him at frequent intervals.

b. Modified Travois (Ascending Steep Slope). The litter is prepared as a modified travois.

(1) A thin sapling is passed through the litter stirrups at the head of the litter. The poles should extend about 18 inches on each side of the litter. The use of poles affords a more secure grip for the bearers at the head of the litter.

(2) Two bearers take their place at the head of the litter. A third bearer, using an improvised rope sling, takes his place at the foot of the litter.

(3) The fourth and fifth bearers take their positions along the rope extending from the head of the litter. The sixth bearer handles the end of the rope.

(4) At the command UP ROPE, the fourth, fifth, and sixth bearers pull on the rope while the first, second, and third bearers lift the litter and climb slowly. The bearers carrying the litter should not try to do all the work. They should allow themselves to be pulled up the slope as they hold the litter off the ground and climb. The position of the bearers should be rotated at each halt to lessen fatigue.

c. Modified Travois (Descending Steep Slope). In making a descent, the most direct passage should be taken. The litter is prepared as a modified travois.

(1) Two bearers hold the rope to assist in lowering the litter.

(2) Three bearers take positions at the litter: two at the head and one at the foot.

(3) The sixth bearer may assist with the foot of the litter, or he may precede the team to:

(a) Pick out a trail, this preventing the squad from having to retrace its steps should there be a cliff ahead.

(b) Make the passage more negotiable by clearing away shrubs and vines.

d. Modified Travois (Lowered from Cliff). If a cliff is too extensive to bypass, the portion with the smoothest face is selected for descending. The litter is prepared as a modified travois. (If using a SKED litter, follow manufacturer's instructions for lacing the litter.)

(1) Notches are cut in the poles to provide an indentation for typing the ropes, thus preventing them from becoming frayed by the stone cliff.

(2) Ropes are lashed to the stirrups at the foot of the litter to serve as guys in keeping the litter from revolving.

(3) After one bearer secures the rope around a tree or large boulder, two bearers lower the litter over the cliff's edge.

(4) One bearer descends the cliff's face on a rope, moving parallel to the litter and assisting the litter over any projections.

(5) The two remaining bearers hold the guy ropes and guide the litter from the foot of the cliff. When the litter has almost reached the base of the cliff, they ease it to the ground.

G-58. **Horizontal Hauling Line.**

The horizontal hauling line is also a method of evacuation. It is addressed in a separate paragraph because of its complexity. The horizontal hauling line is used in those cases where a steep slope or cliff must be scaled and where, at the same time, there is an intervening obstacle such as a swiftly running mountain stream. It can also be used to span a chasm when a bridge has been demolished. This method should be used only where there will be a considerable number of patients (a warming station or collecting point) and should not be installed for the evacuation of only one or two patients. It can also be used to lower or to raise patients over obstacles. The installation and operation of the hauling line is addressed below.

a. This apparatus is a continuous rope cableway secured by a system of snaplinks spanning a maximum of 1,000 feet between terminals. A slope of at least 10 degrees is required for proper operation.

b. A Stokes litter containing the patient is suspended from the top of the cable at the upper terminal, and an empty litter is suspended from the bottom of the cable at the lower terminal.

c. The litter patient at the upper terminal is lowered by gravity to the lower terminal. A relay line attached to the litter prevents it from rapidly and uncontrollably descending. At the same time, the empty litter at the lower terminal is raised to the upper terminal ready to receive the next patient.

d. One bearer stands at the upper terminal to control the relay line and another bearer stands at the lower terminal ready to receive the patient.

(1) Installation. The horizontal hauling line is installed in four steps:

(a) By means of a bowline, secure a 10-centimeter manila rope to a tree far enough from the edge of the cliff (2 to 3 meters) to permit freedom of movement by the medical personnel.

(b) On the opposite side, pass the other end of the rope around another fixed point (tree, boulder, or vehicles), and make a transport knot to pull the rope as taut as necessary. All traverse ropes should have a certain amount of slack. When manila or sisal rope is used, a five percent sag should be allowed to avoid undue fatigue in the rope.

(c) To suspend the litter, place two snaplinks on the traverse rope and attach one long litter carrying strap to each. Attach an upper and lower retrieving rope to either the litter stirrup or to the respective snaplinks. In the latter case, the loose ends of each rope are tied together above the center of the litter so that, when drawn up or down, both snaplinks move simultaneously.

(d) After the patient has been secured to the litter, the litter is raised, and the litter carrying straps or suspension ropes are passed through the stirrups and fastened together or else secured to the opposite stirrup.

(2) Operation. The horizontal hauling is operated as follows:

(a) For the ascent, three men can easily raise the litter along the traverse by pulling on the upper retrieving rope. The pull should be steady and smooth in order to prevent jolting and swaying.

(b) For the descent, a gentle pull on the lower retrieving rope is enough to break the inertia and let gravity do the rest. During the descent, the men on the upper side should control the speed of the descent through their retrieving rope. It may be necessary to pull the patient the last few meters when the litter nears the low point of the slack in the traverse rope.

(3) Refer to TC 90-6-1 for additional information on the construction of a horizontal hauling system.

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